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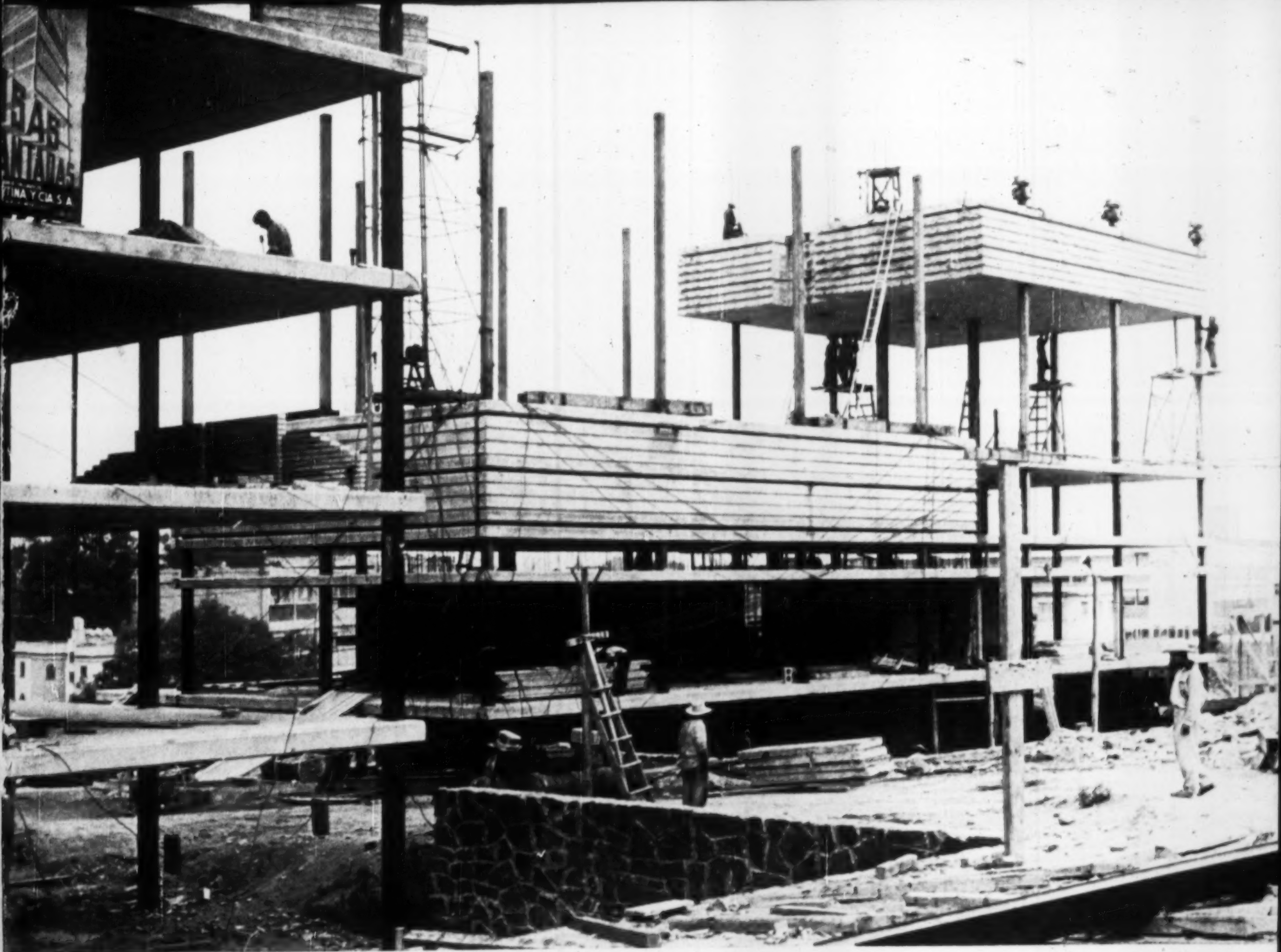
▶ Mud and Indians pose Erie Thruway problem [illegible]



Lift slab sets new high — 11 stories *p. 67*

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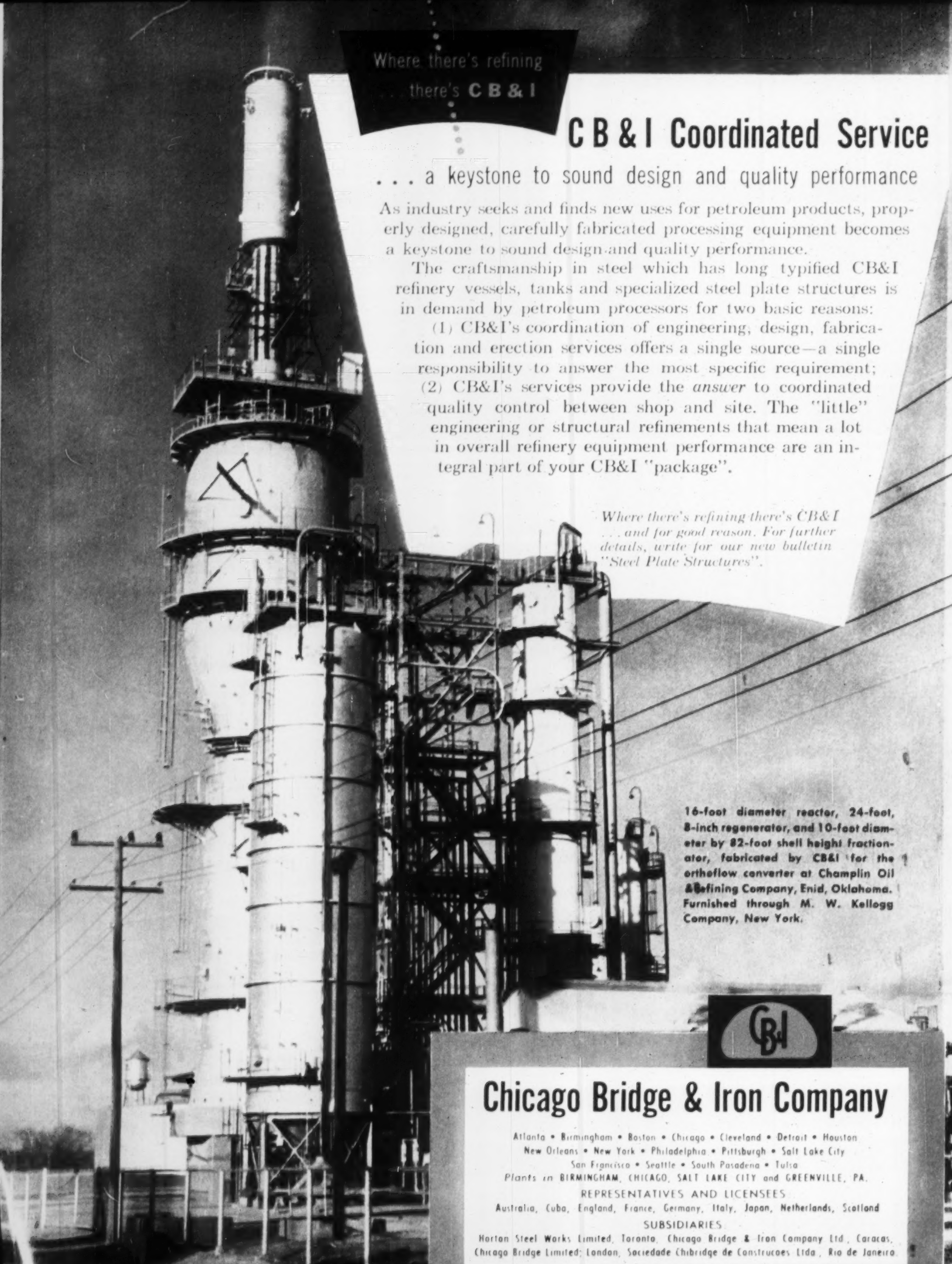

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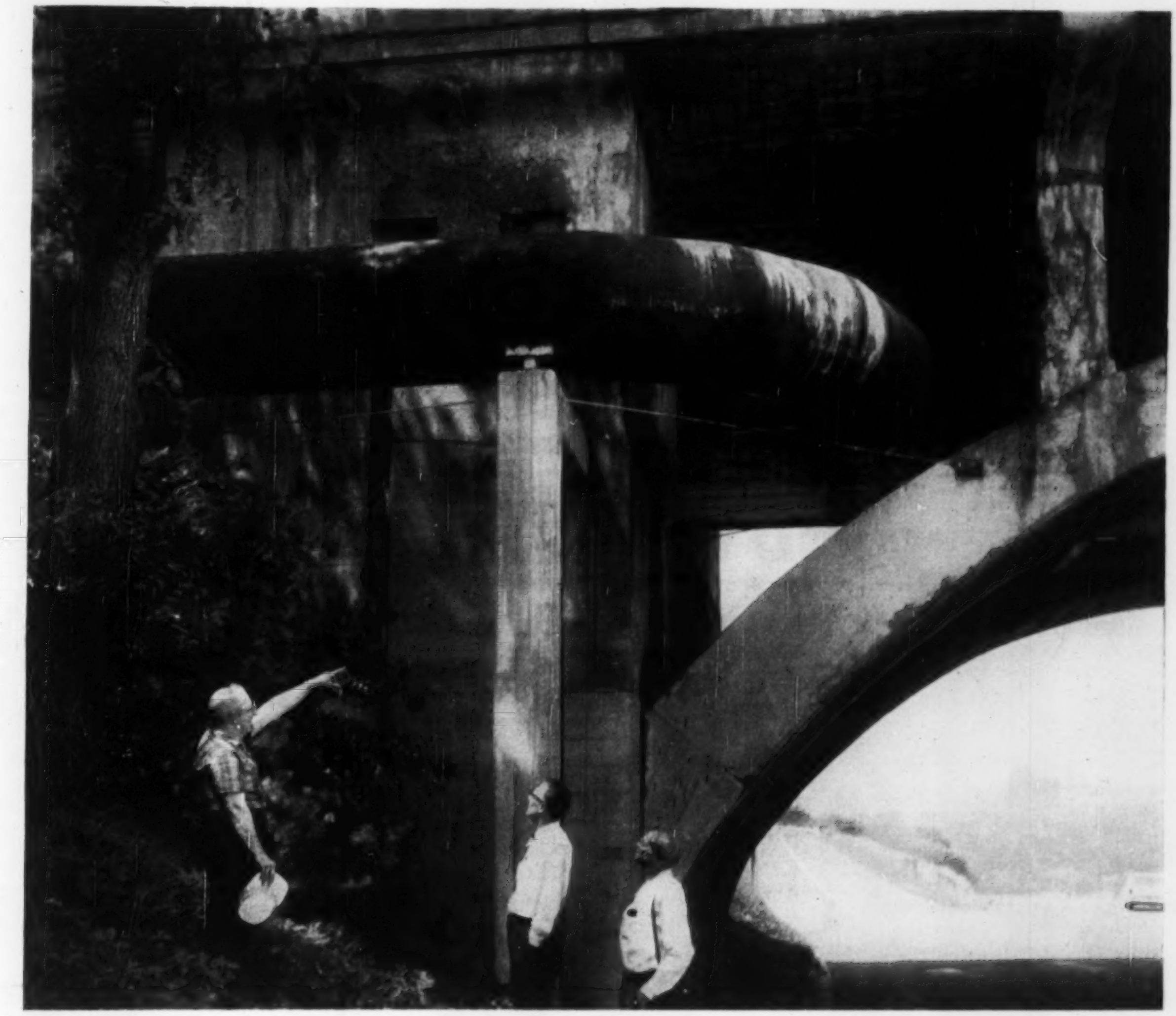

From left: W. C. Lathrop, Senior Civil Engineer; L. L. Halladay, Waterworks Engineer; C. R. Liese, Senior Civil Engineer—Water Works Dept., Minneapolis

Temperatures from 32° below to 100° above haven't hurt this tar-enameled steel pipe

Here in Minneapolis two long spans of exposed steel pipe have been subjected to a 132-deg temperature range for the last eight years. But despite frigid winter spells down to 32 deg below and scorching, 100-deg summer days, the pipe has functioned perfectly.

The 48-in. ID main shown above extends 837 ft across the Mississippi River cradled under the Franklin Avenue bridge. The pipe was coal-tar enameled inside and out and has no other protection. It was supplied by Bethlehem in 40-ft lengths joined by butt-welding. The pipe rests on rollers to permit movements due to expansion and contraction, but expansion joints were not required.

The river crossing is a small portion of the city's 19.5-mi "Big Inch" water main which was completed in 1949. Bethlehem supplied 102,500 ft of 48 x ⅜-in. tar-enameled steel pipe for the project. It was laid, with welded joints, by the Water Works Department of the City of Minneapolis.

The Water Works Department states that the entire line has given outstanding service. The fact that no leakage or loss of flow has been reported indicates that the interior lining is in excellent condition. Visual inspection has not disclosed any impairment to the pipe coating.

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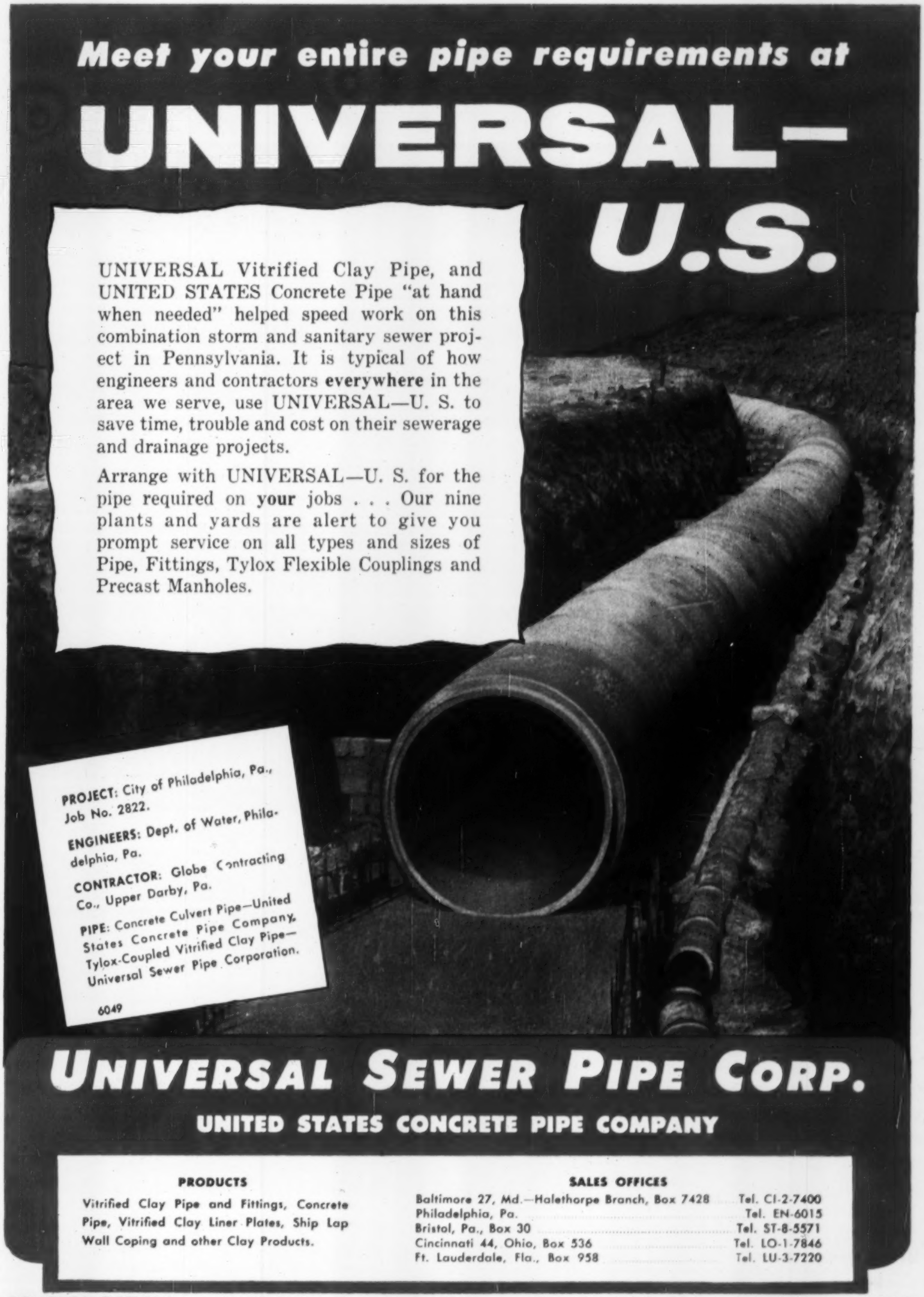

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OLIN POLYETHYLENE FILM

Mr. Parsons, right, shows Mr. O'Donnell how 006" Olin Polyethylene was stapled to frames made from 1" stock. Mr. O'Donnell's firm, P. J. O'Donnell Co., Boston, Mass., supplied the film.

"Just ask my boss mason, Ted Carter, what Olin Polyethylene meant to us," says Mr. Albert W. Parsons, job superintendent during the building of this new Polaroid plant. "When the temperature goes below 32 degrees, mortar usually freezes, of course. But, because we closed in with Olin Polyethylene, that didn't happen to us. We were able to lay our brick – and comfortably too – even during *zero* weather.

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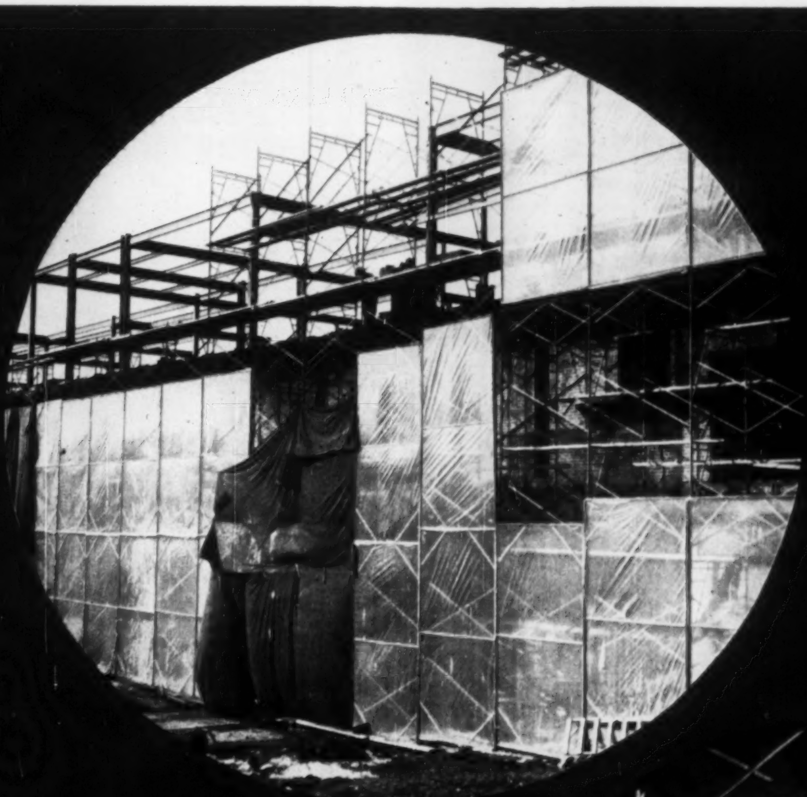

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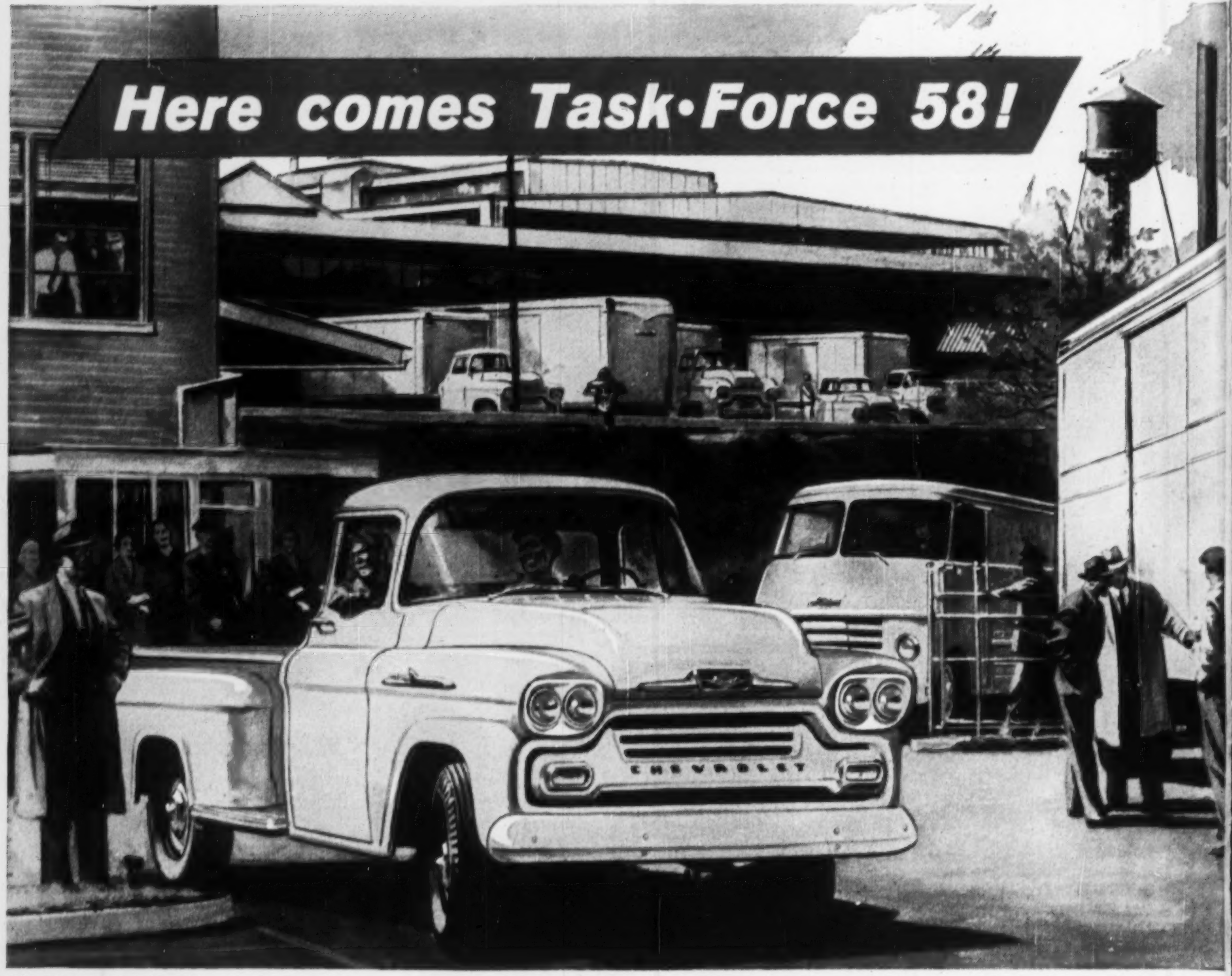
Here comes Task•Force 58!



New light-duty Apache—Series 31 pickup

New Step-Van—One of three new Forward Control models in Apache Series

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Just look at all they offer that's new and better . . . and you'll see why these new Chevies are the fleetest, sturdiest, handsomest dollar-savers yet! Meet Chevrolet for '58!

THREE NEW MODEL LINEUPS!

It's the biggest, most versatile Task-Force fleet yet—with an appetite for work to match! Every model sports fresh, broad-shouldered styling. And there's new hard-pulling power in every weight class, too—from the handy, handsome pickups to strapping tandems with GCW ratings all the way up to 50,000 lbs.

Just name your job. Your Chevrolet dealer will gladly name the new Apache, Viking or Spartan model to do it faster, easier and more economically than any other truck on the road!

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Nifty, thrifty Apaches—built to outwork anything in their weight class—offer three completely new

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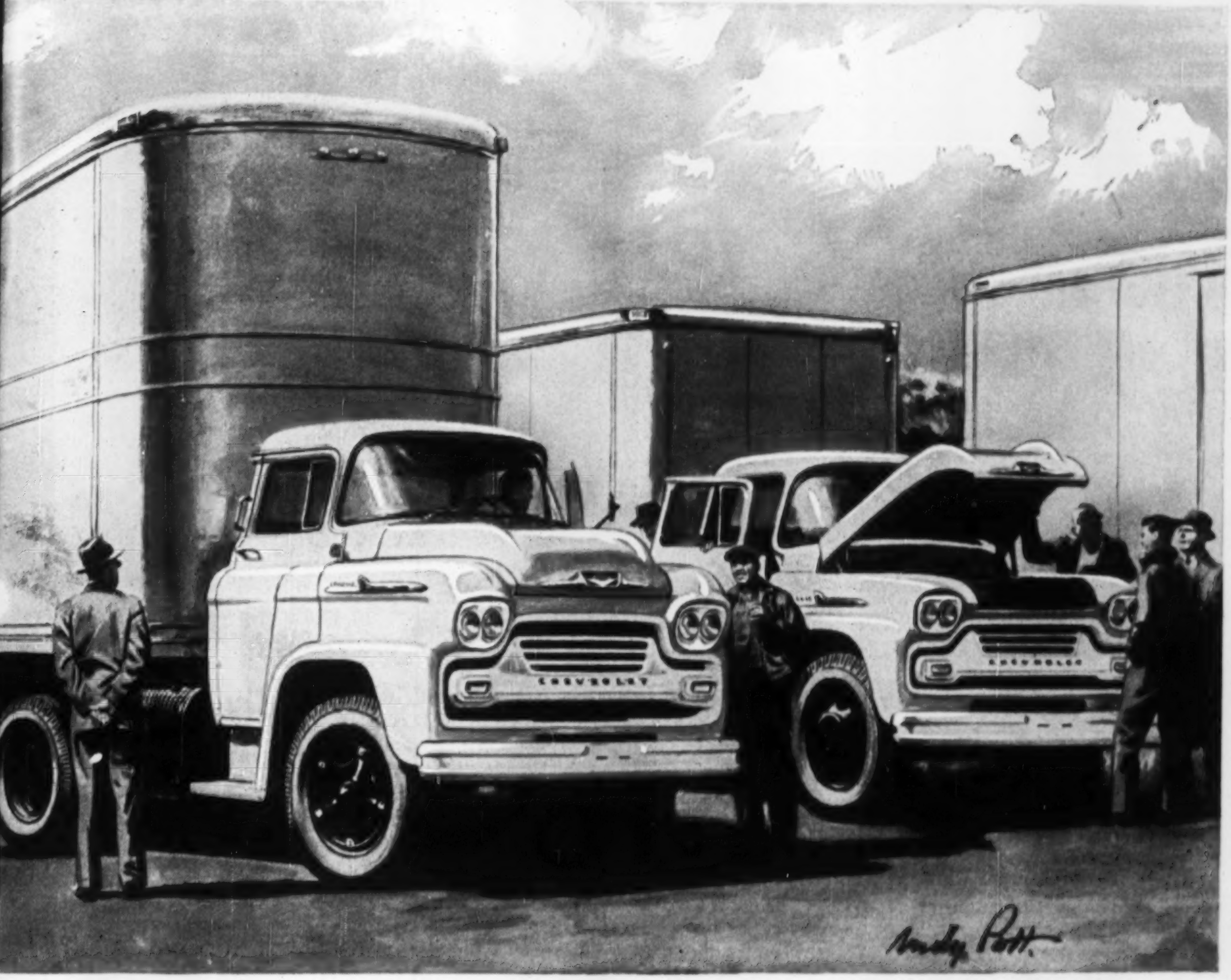

New heavy-duty Spartan—Series 90, L.C.F. model *New medium-duty Viking—Series 60 cab and chassis*

NEW HUSTLE! NEW MUSCLE! NEW STYLE!

Step-Vans equipped with walk-in bodies. The expanded lineup also includes high-capacity panels, pickups and four-wheel drive trucks—with a model tailored to take on your most troublesome delivery chores. There's new pep and power in any engine you pick, too—whether it's a 6 famous for economy or a short-stroke high-compression V8.

NEW MEDIUM-DUTY VIKINGS

Hardy, hard-working Vikings roll in with nine brand-new models, offering new cab-to-rear-axle dimensions for improved semi-trailer, dump, stake and van-type operations. Options available on these and most other new models boost GVW ratings all the way to 21,000 lbs.—as high as many competitive heavyweights. Yet you get traditional Chevrolet economy from high-compression engines that include the industry's most popular 6's and V8's packing up to 175 h.p.

NEW HEAVY-DUTY SPARTANS

The robust Spartans make hauling history with the most revolutionary truck engine in decades—the Workmaster V8 with Wedge-Head design. The combustion chambers are in the cylinder block! Featured in Series 90 and 100 heavyweights, this 230-h.p. engine achieves a new high in efficiency. There's also an 18,000-lb. rear axle to go with it, an optional high-tonnage 9,000-lb. front axle and cast-spoke wheels on every model. Look over Task-Force 58 at your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

1958 CHEVROLET TASK·FORCE TRUCKS! CHEVROLET

Philip H. Seligson, New York designer, one of the winners in the 1957 MARS Contest. Mr. Seligson's project, "21st Century City," is featured in the MARS presentation on this page.

MARS announces new design contest

The MARS Outstanding Design Contest of 1957 created such wide interest that MARS Pencils is sponsoring another contest for 1958.

If you are an engineer, architect or student, the MARS contest offers you a "showcase." It provides you with a valuable opportunity to have projects you designed shown in leading magazines where they will be seen by the men in your profession.

You are invited to send in your projects. For every submission that is accepted

MARS pencils will pay you $100

This $100 is paid you simply for the right to reproduce your project in the MARS Outstanding Design Series. There are no strings attached. You will be given full credit. All future rights to the design remain with you. You can reproduce it later wherever you like and sell or dispose of it as you wish.

The subject can be almost anything — aviation, space travel, autos, trains, buildings, engineering structures, household items, tools, machines, business equipment, etc. Projects will be selected on the basis of appeal to design-minded readers, broad interest, attractive presentation. Do not submit a design that is in production. In fact, the project does not need to have been planned for actual execution. It should, however, be either feasible at present or a logical extension of current trends. It cannot be unrealistic or involve purely hypothetical alterations of natural laws.

There is no deadline for entries but the sooner you send yours in, the greater the probability of its selection for the 1958 MARS Outstanding Design Series.

It is Simple To Submit a Design For Mars Outstanding Design Series

Just mail in an inexpensive photostat or photocopy of the subject—one you can spare, since it cannot be returned — and a brief description.

If your entry is accepted, we will ask you to send in a clear photograph or rendering of the design (so that we can make a sharp photograph) suitable for reproduction—after which your material will be returned to you.

Send your entry to:

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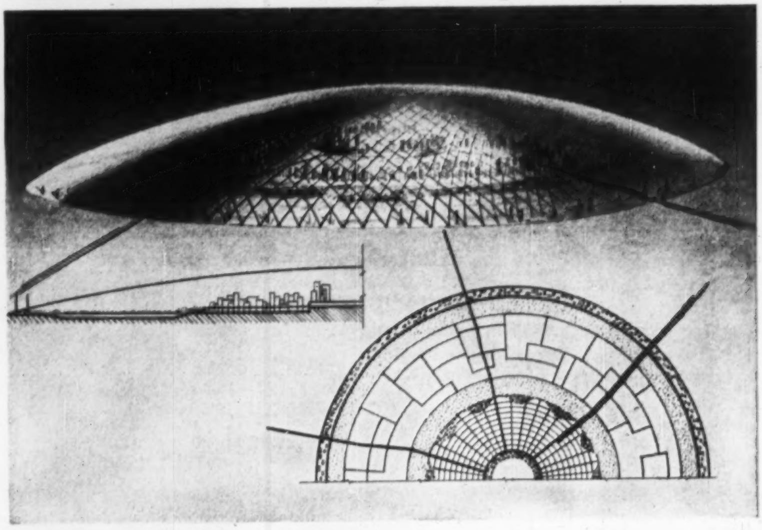
MARS outstanding design SERIES



21st century city

The shallow, plastic-faced, Geodesic dome makes this city of the future look strange to 20th century eyes. But designer Philip H. Seligson has combined practical economics with creative thinking in committing his concept to paper. Industries are located at the outer circumference of the city; discharge their smoke through stacks that pierce the dome. Central air conditioning controls the temperature—winter or summer the climate is perfect. Instead of building their own four weather walls and roof, insulating them, heating and cooling them, people can build their walls merely as grilles and curtains.

No matter which of today's ideas become reality, it will be as important tomorrow as it is today to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—from sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and—last but not least—the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.

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Reader Comment

Reduced Lumber Stresses

SIR—The two reasons reported (ENR Sept. 26, p 23) for the action of the International Conference of Building Officials in reducing the working stresses for the stress-grades of lumber from the Standard Grading and Dressing Rules No. 15 of the West Coast Lumbermen's Association and the 1956 Grading Rules for Southern Pine Lumber of the Southern Pine Association are surprisingly contradictory.

The determination of working stresses for a material involves many tests and engineering considerations. These data are voluminous, and engineers, designers and building officials, by and large, do not feel it is necessary to delve deeply into them. Their action is therefore not too surprising. Surely, had the building officials fully understood the question, they would not have approved the reduction in stress values for three species and changed their code creating these contradictions.

Since 1949 the allowable working stresses for lumber tabulated in the Uniform Building Code have been based on normal loading, and this level of loading is defined in the code. Briefly, normal loading means fully stressing a wood member to the tabulated allowable stress for approximately 10 years, either continuously or cumulatively. Furthermore, the code provides that those tabulated-stress values for lumber must be reduced to 90% when the contemplated loading permanently and fully stresses the member for 10 years or more.

These provisions continue in the code unaltered, and contradict the explanation of a need to provide for permanent loading. What is even more surprising is that this discriminatory action has been applied to only three species, covered in two association grading rules. This leaves two-thirds of the table in the code for working stresses for stress-grades under other grading rules at the normal loading level. What is even more confusing is that at the same 35th annual meeting, the building officials approved the working stresses for the

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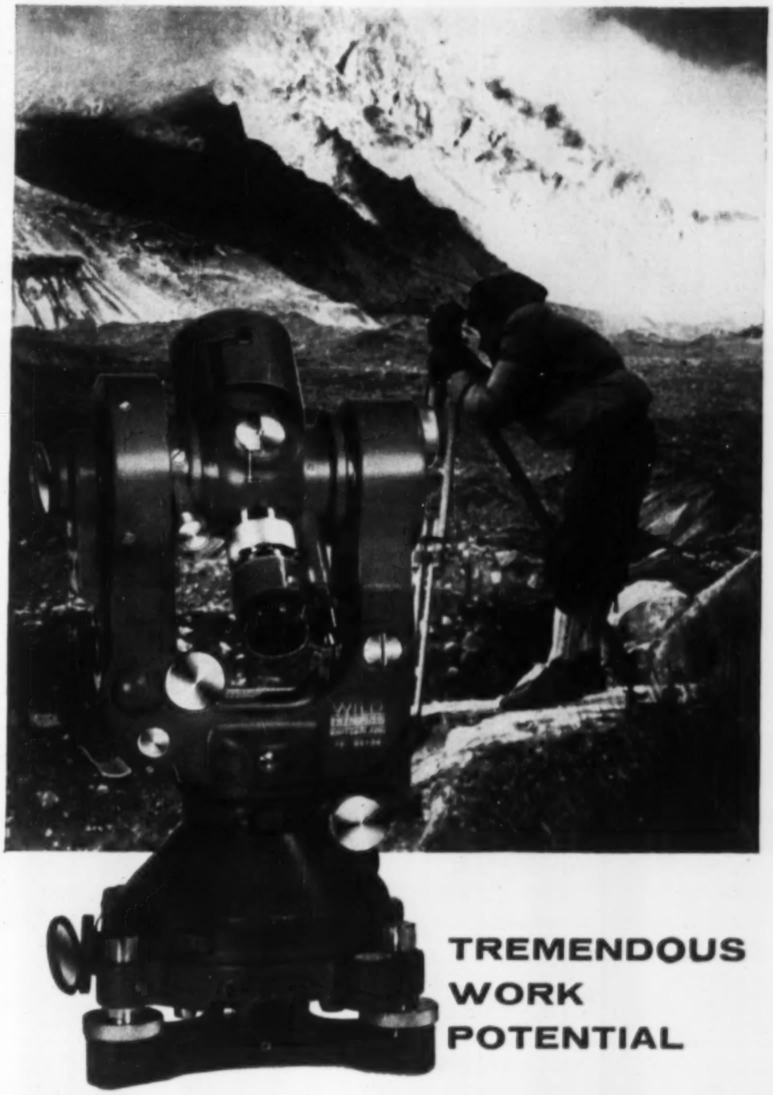

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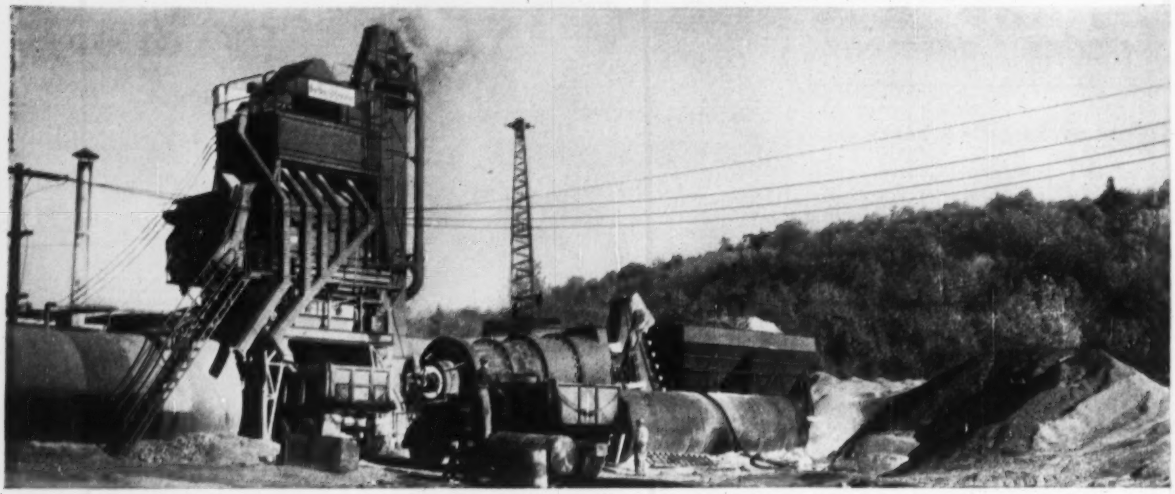
On the Massachusetts Turnpike



Bigger tonnages with BatchOmatics

200 tons per hour—that's the kind of production Alexander Construction Co. is getting from its 6000-lb. BatchOmatic. This plant will produce 115,000 tons for a 13.4-mile section of the Massachusetts Turnpike.

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Get contest aids from your K&E dealer: Information booklets, extra contest entry blanks, samples of Albanene, too, if you need them. You can enter as often as you please.

Or use a plain sheet of paper if someone's already snipped the blank below. Give your name, address, and firm name, twenty-five words or less telling why you prefer Albanene tracing paper, and mail to K&E Albanene Contest, Box 160, New York 46, N. Y. before midnight, November 30, 1957.

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DUMBBELL DESIGN
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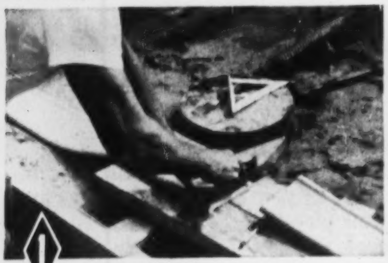
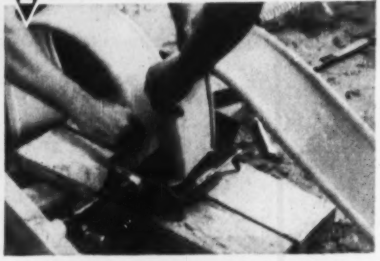


1 Ends to be spliced are squared.



2 Place ends on heated plate and hold firmly until material begins to melt.

3 Join ends immediately, maintain slight pressure until material cools.

4 Completed splice becomes integral part of waterstop.

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same West Coast and Southern Pine grades at the normal loading level when used as laminations in structural glued laminated lumber. There is also a contradiction in the fact that the new code tables for non-stress graded lumber used in dwelling construction (which classify them into usage groups according to strength and bending) have been based on assumed stresses at the normal loading level. This gives a premium to the use of non-stress grades and a penalty to the use of three stress-graded species in dwelling construction.

For many years the Uniform Building Code has provided that the maximum stress values tabulated therein shall only be used when the lumber is identified by a grade mark of a grading agency. The building officials have therefore long had the authority for insisting on "lumber of assured stress grade" and there is no question of its availability. Whether "designs (are) made and carried out under competent supervision" or not is the responsibility of the building official, for such is the basis of the adoption of building codes and the employment of building officials.

As the three species that were affected by the building officials action are those most available throughout the commercial markets, the result can only mean higher lumber costs in dwelling construction and in engineered structures.

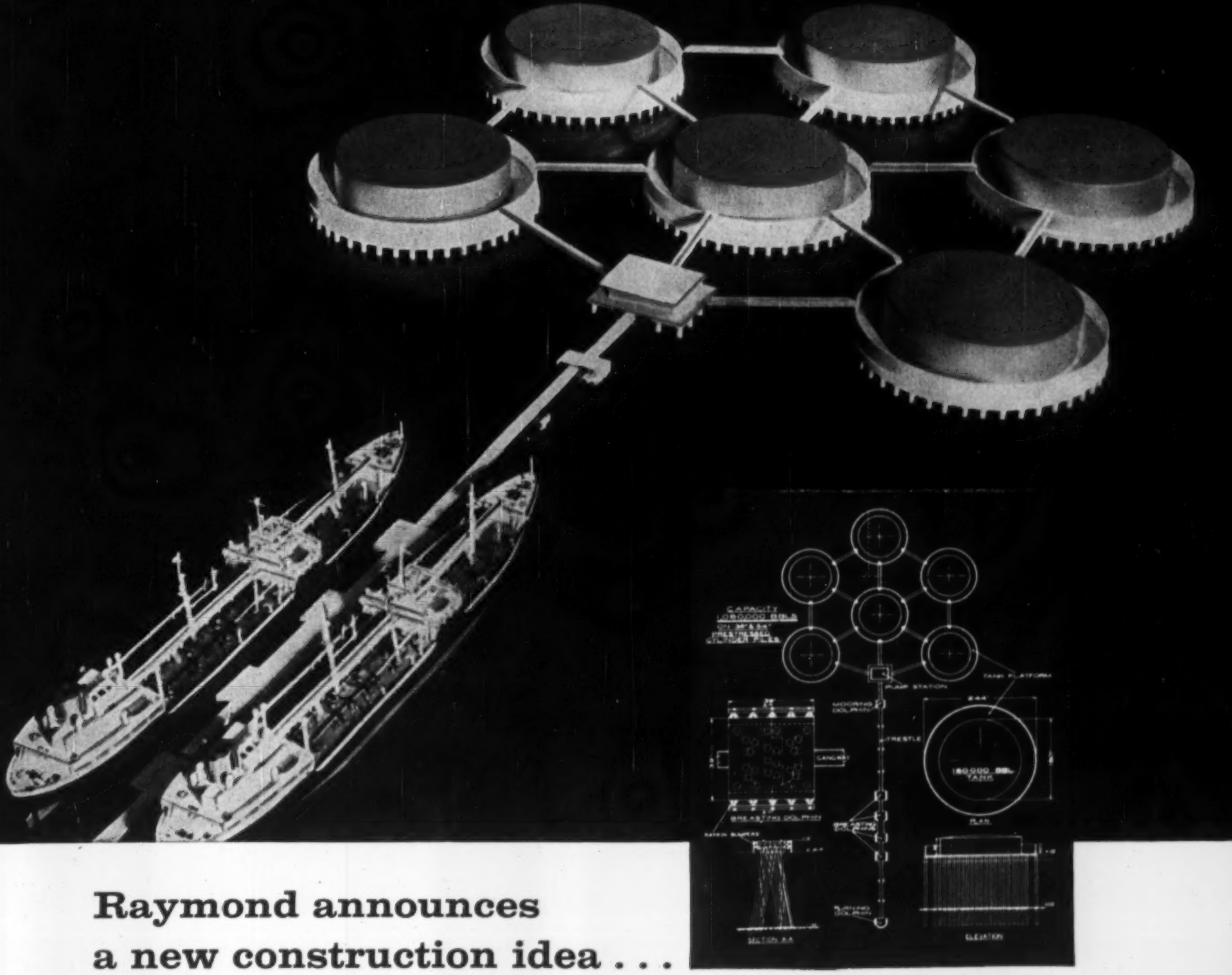
It is probable that only those few officials who proposed the 10% reduction in working stresses for the three species actually know the true reason for that recommendation. Certainly this writer does not, inasmuch as the stresses for the stress-grades, as given in Grading Rules No. 15, were determined by Standard No. 25-3 of the Uniform Building Code Standard—Volume III and the U. S. Forest Products Laboratory says that these stresses are correct.

T. K. May
Director of Technical Service
West Coast Lumbermen's Association
Portland, Ore.

Highway Dept. Salaries

Sir—I have just read with interest your editorial on the withdrawal of the no raiding clause in contracts made between state highway departments and consulting engineering firms (ENR Aug. 1, p. 96).

There were many reasons why this clause was recommended by many states and the Bureau of Public Roads. The clause gave the state highway engineer a bargaining right. An employee to be legally frozen in his position must be offered comparable pay and benefits to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PLAN
BREASTING DOLPHINS
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ELEVATION

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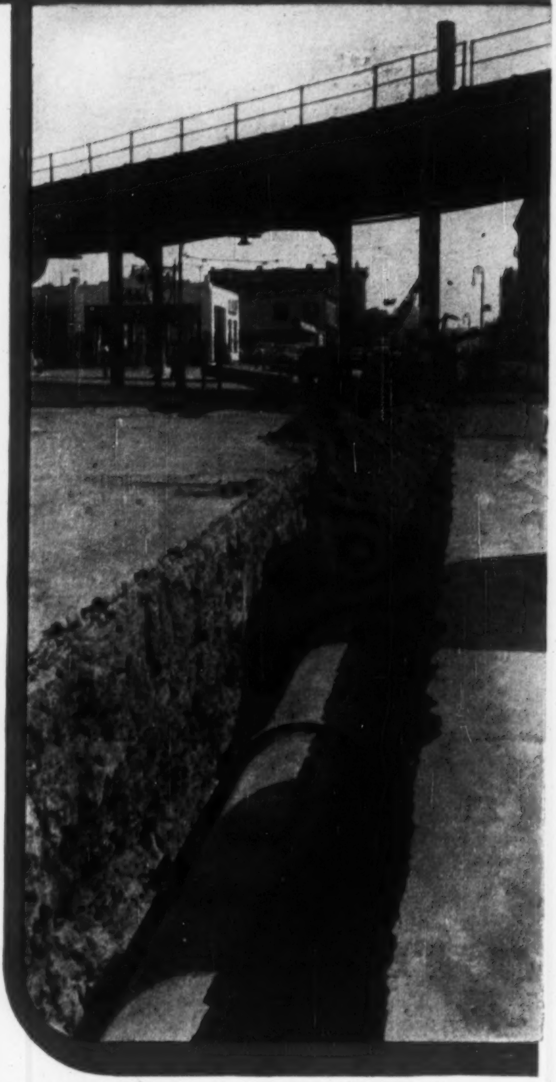
For information, write: Cast Iron Pipe Research Association, Thomas F. Wolfe, Managing Director, Suite 3440, Prudential Plaza, Chicago 1, Illinois.



Brooklyn, N. Y.—Laying 42" Mechanical Joint cast iron pipe for gas main.

CAST IRON

Cast Iron Pipe Research Association, Thos. F. Wolfe,
Managing Director, Suite 3440, Prudential Plaza, Chicago 1, Ill.

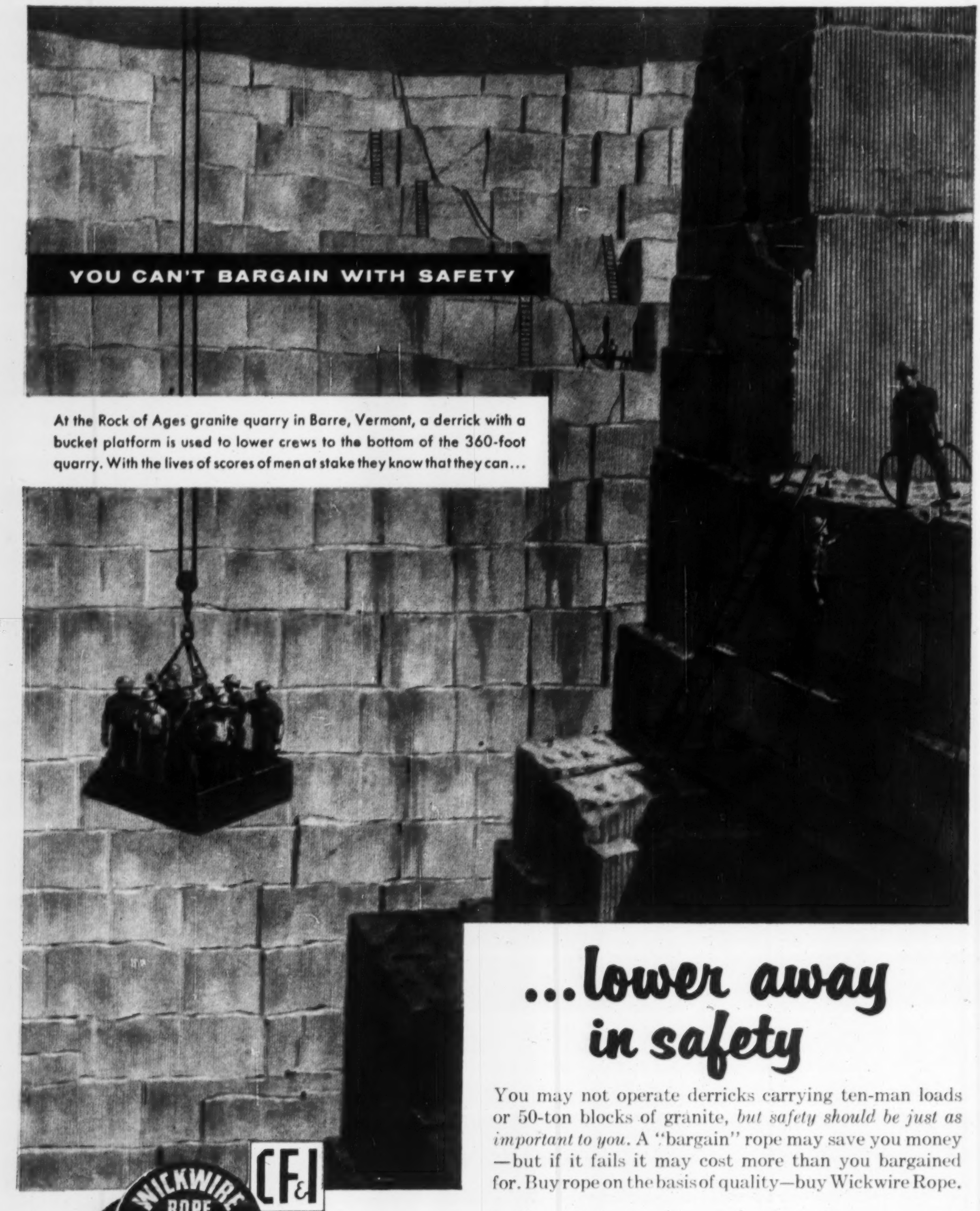
CAST IRON PIPE

wherever the job

Portland, Ore.—Large diameter cast iron sewer lines being installed across Willamette River, part of program to restore normal river conditions for salmon spawning.

St. Louis County, Mo.—36″ cast iron intake line at the North County Water Plant of the St. Louis County Water Company.

SERVES FOR CENTURIES...



YOU CAN'T BARGAIN WITH SAFETY

At the Rock of Ages granite quarry in Barre, Vermont, a derrick with a bucket platform is used to lower crews to the bottom of the 360-foot quarry. With the lives of scores of men at stake they know that they can...

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You may not operate derricks carrying ten-man loads or 50-ton blocks of granite, *but safety should be just as important to you.* A "bargain" rope may save you money—but if it fails it may cost more than you bargained for. Buy rope on the basis of quality—buy Wickwire Rope.

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those employees doing the same type of work not under a job freeze. Some previous negotiated contracts have been performed with as high as 40% of the work being done by state highway personnel on a part time basis. Voters at a public referendum defeated the authorization permitting negotiated contracts in engineering for public works projects in the state of California. In a May issue of ENR the Bureau of Public Roads indicated that highway design work was being performed more economically by the states than by consulting engineers. The 1956 Federal Aid Highway Act requires that states receiving this aid must have a highway department capable of supervising this program. An unrestricted percentage of negotiated contracts in any state destroys the bargaining power of the highway engineers with their state legislators.

These conditions place a responsibility on the Bureau of Public Roads to see that all state highway departments adjust pay and fringe benefits so that the state employee receives the same benefits as offered the employees of the consulting engineer.

James Miller
Pennsylvania State Highway Department
Retired

For the Record

Sir—In "Little Railroad Gets Biggest Lift Bridge" (ENR Sept. 5, p. 36) you mention that the new Arthur Kill Span will be the world's longest lift span. The swing bridge it replaces was, when built, and for many years thereafter, the world's longest swing span (Ref: 1887 issues of Engineering Record).

It would be interesting to know if this swing span is still the world's largest.

James Wilson
Jamaica, N. Y.

Editor's Note: ENR files indicate that a 525 ft railroad swing span completed in 1927 at Fort Madison, Iowa, now holds the record.

CALENDAR

American Society of Civil Engineers, Kansas City Section, regional highway conference, Continental Hotel, Kansas City, Mo., Nov. 7-8.

American Public Health Association, annual meeting, Cleveland, Ohio, Nov. 11-15.

American Standards Association, National Conference on Standards, St. Francis Hotel, San Francisco, Calif., Nov. 13-15.

Consulting Engineers Council, national board of director's meetings, Abraham Lincoln Hotel, Springfield, Ill., Nov. 15-17.

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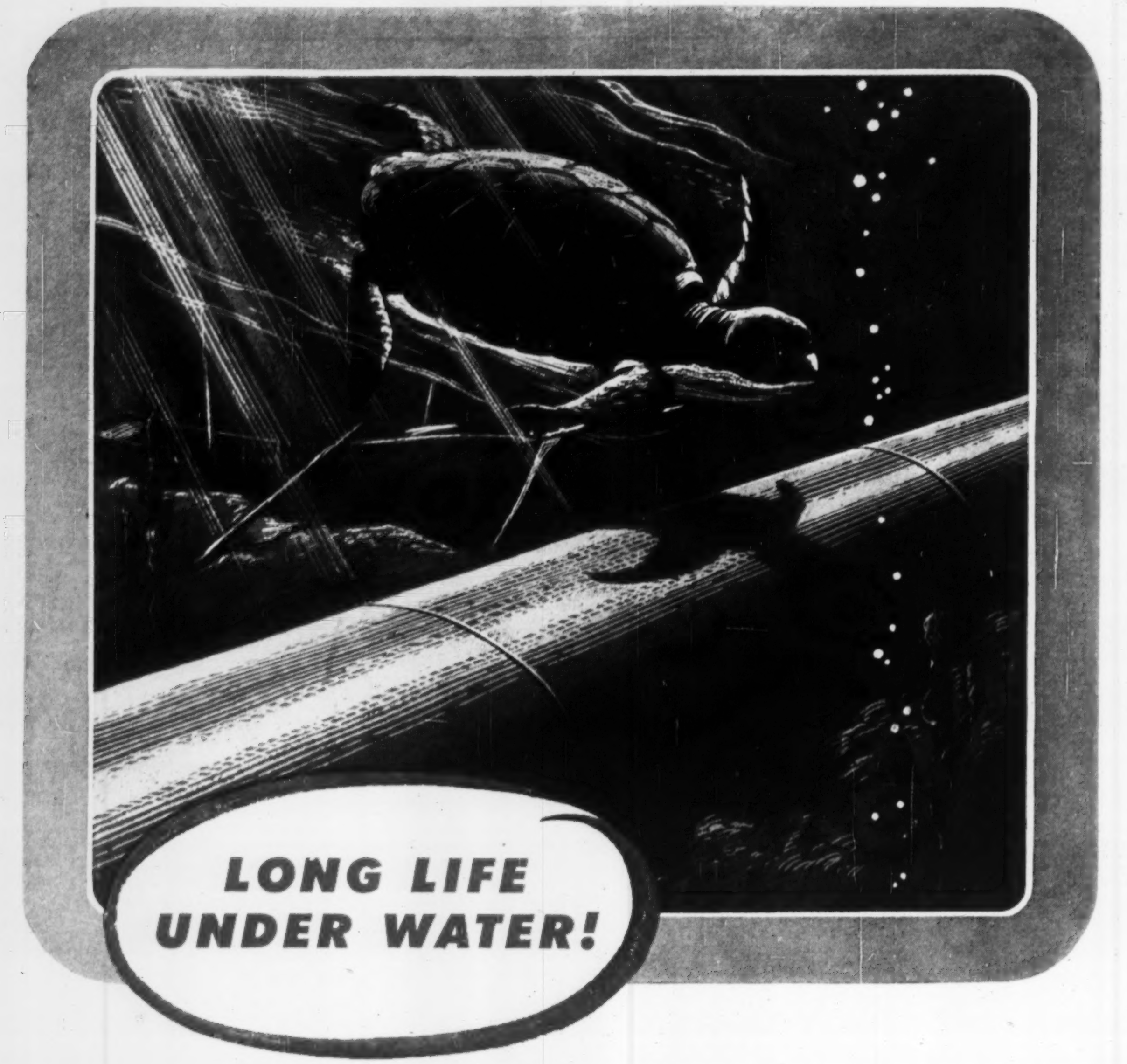

The giant marine turtle, or "leatherback", is reputed to live for 250 years. This tremendous life span is, in part, attributable to its tough, durable shell—a natural protection against the rigors and constant buffeting of underwater life.

LOCK JOINT REINFORCED CONCRETE SUBAQUEOUS PIPE owes much of its unusual underwater longevity to its "shell"—the dense concrete wall which makes it practically ageless. To assure the strongest possible concrete, periodic compressive tests are taken of each day's run of concrete in every Lock Joint plant. This is only one of the many quality control measures marking every phase of the manufacture of Lock Joint Pipe.

Can you guess how many cubic yards of this high quality concrete were required in the production of the 18,000 ft., 120 inch diameter Lock Joint Reinforced Concrete Subaqueous Pipeline for the intake of Cleveland's water supply system? The answer can be found in the picture above.

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

NEW LIFT-SLAB RECORDS—Steel work began last week in Columbus, Ohio, on an 11 story semi-automatic parking garage that will be this country's tallest lift-slab building. From the sub-basement floor, two stories below-grade, the structure will rise 95 ft—six feet short of the new world mark established by a Mexico City apartment house (see p. 67). The new garage will accommodate 200 cars on 14 decks, including the top slab. All floor slabs will be cast at sub-basement level. Tibbals-Crumley-Musson are the architects-engineers; General Maintenance & Engineering Co., the contractors; both Columbus firms. Skyhook Lift Slab Corp., of Kansas City, holds the lift-slab subcontract.

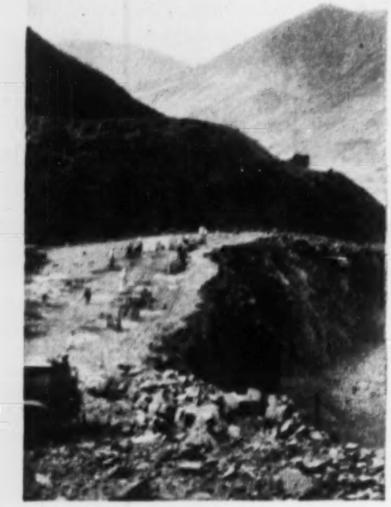
MANAGEMENT FOR CONSTRUCTION—Greater attention to problems of the construction industry was a recommendation of an American Society of Civil Engineers task committee on professional education (ENR Oct. 31, p. 100). And one of the problems of the industry is engineering manpower of a caliber to become its management. Two possible answers to that problem are suggested in separate stories in this issue: What some colleges are doing to aim civil engineering education more directly at needs of future construction management is told in an ENR survey report on page 23. What one progressive contractor is doing to make construction supervisors out of green college graduates is told starting on page 145.

PROTECTION FOR ARCTIC PILING—Prospective bidders on a military installation to be made at Bethel, on Alaska's arctic coast, learned at a pre-bid conference held in Anchorage by the Corps of Engineers' Alaska District, that the district has developed a new method of protecting steel piles against permafrost. The piles are encased in metal collars, which then are filled with a mixture of wax and oil. This prevents freezing ground from adhering to the piles and forcing them upward.

NEW CONNECTION TO SEAWAY—The Pennsylvania State Planning Board has dug out 20 year old plans of the Corps of Engineers to link Lake Erie and the Ohio River by water, and may again push for its construction. It expects a financial feasibility report—based on existence of the St. Lawrence Seaway—from Ford, Bacon & Davis of New York City next month. One of the proposed routes would run up the Beaver and Mahoning Rivers, then from Youngstown via canal (and locks) to Lake Erie. A second route being re-studied runs from the Allegheny River to French Creek and by canal which would enter the lake west of Erie, Pa.

NEW RESULTS OF MONSANTO RESEARCH IN USE OF AMMONIUM NITRATE AS AN EXPLOSIVE

Typical shot with Monsanto's new kind of prilled NH_4NO_3



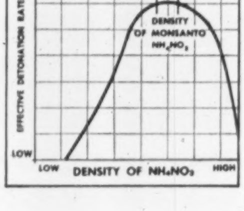
View of area involved in the blast. Shot was made in heavy columnar basalt at dam site. Used as an explosive: a new, top-quality, prilled NH_4NO_3 that Monsanto research developed to give you optimum savings, safety, speed and ease of handling.

View at time of detonation. The system of detonation recommended by Monsanto, in conjunction with Monsanto Ammonium Nitrate, will yield equivalent pound-for-pound results with 60% gelatin dynamite at one-fourth the cost.

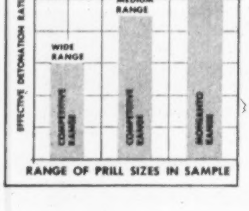
Results of blast. The powder factor in the shot above was 0.4 lbs. per cubic yard. Breakage of rock was considered ideal by contractor. Monsanto's experienced staff can give you complete technical service. Just phone Monsanto.

Photos courtesy of MORRISON-KNUDSEN COMPANY, INC.

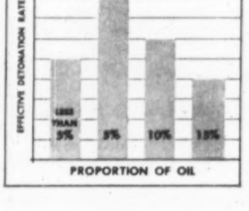
Monsanto Ammonium Nitrate is now produced according to the specifications determined by these findings of Monsanto research. Result: more effective blast at greater savings. Monsanto is the world's largest manufacturer of prilled ammonium nitrate—and leader in developing the use of NH_4NO_3 as an explosive for open work. Request report presenting latest research findings.



OPTIMUM DENSITY OF PRILLED NH_4NO_3 FOR EXPLOSIVE USE



OPTIMUM PRILL SIZE DISTRIBUTION RANGE



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WASHINGTON OBSERVER

- **Sputnik imperils water projects**
- **New economic forecasting season opens**
- **Homebuilding: Long upgrade ahead**
- **Slow turnover in mortgage funds**

● **Russia's earth satellite, Sputnik, may play hob with federal construction programs.** At any rate, that's the fear of the National Rivers and Harbors Congress, whose president is Congressman Overton Brooks. Speaking for the potent lobby group, Rep. Brooks says he sees a direct threat to construction appropriations in the pressures that are growing up for putting more money into defense missile and rocket research and production.

Water development projects, according to this theory, face "intensified opposition" not only among economy-minded congressmen but also in "the highest Administration circles." Even the long-delayed omnibus authorization bill—slated for passage next year—is in for "sure trouble," says Rep. Brooks.

—

● **The capital's new season of economic forecasting is about to open.** Due to business uncertainty, the Washington look-aheads will be read more carefully this year than in a long time. One of the first for '58 is, of course, the construction forecast due from the Commerce Department by mid-November.

Between then and March, in approximate sequence, you'll be interested in seeing key forecasts on prospects for:

Major industries (24 of them), by Commerce Department's Business & Defense Services Administration, due in December—a six-month forward forecast on anticipated business volumes.

Overall business, by the President's Council of Economic Advisers and the Joint Congressional Economic Committee, due in January.

Corporate profits and personal income, separate reports, due in January from the Treasury.

Plant and equipment spending, government's best compilation on size of the expected downturn in 1958. This report is due in March from the Commerce Department and Securities & Exchange Commission.

—

● **Homebuilders foresee a long steady uptrend for construction during the next 18 years.** Projections worked up for policy planners of the National Association of Home Builders indicate a 50% growth in income of non-farm families by 1975, and a comparable increase in the number of such families from 43 million now to 64 million.

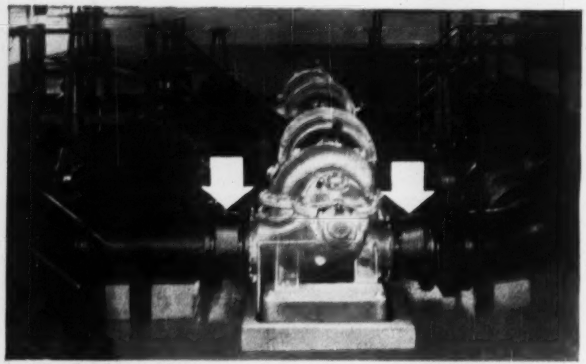
Especially intriguing is NAHB's projection of incomes to 1975. It estimates that 27% of non-farm families will receive more than $10,000 a year (compared to 9% at present), and that only 35% of non-farm families will receive less than $5,000 per year (compared to 63% now).

—

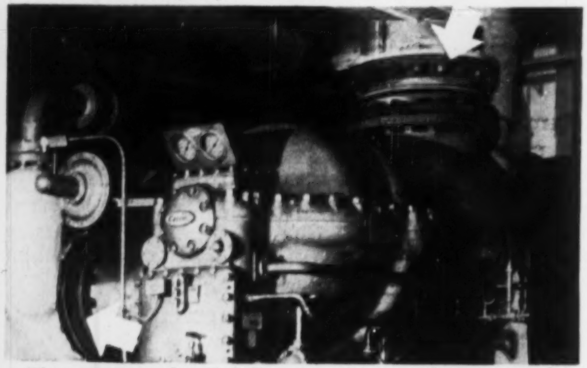
● **The government is advancing a new theory on the shortage of mortgage money.** An article in the Labor Department's MONTHLY LABOR REVIEW finds that the shortage is due not to reluctance on the part of investors, but rather to slower turnover of available funds caused by longer repayment terms and sharply higher average loans. The article concludes that the "supply of mortgage funds has increased in proportion to the general growth of the economy."

EXPANSION JOINTS

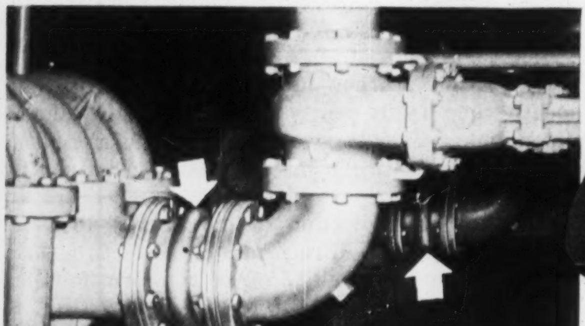
Expanding the Designer's Scope



The flexible rubber expansion joints on the centrifugal pump installations (above) are made by U. S. Rubber. They prevent stresses caused by expansion and contraction.



This compressor has U. S. Expansion Joints on the suction and discharge lines. Like all U. S. Joints, these insulate against the transfer of vibration and noise.



Piping equipped with U. S. Expansion Joint to compensate for any misalignment caused by load stresses, wearing of parts or settling of building.

U. S. Rubber Expansion Joints are resilient and therefore do not, like metal, set permanently when compressed. Constant flexing merely keeps them alive... prevents brittleness.

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- The outside diameter of the arch is smaller than on metal joints. (Face-to-face dimensions, even with multiple arches, are smaller.)
- Weight is much less. This, plus the fact that no gasket is needed between flanges (metal joints require gaskets) results in an easier installation lowering the cost.

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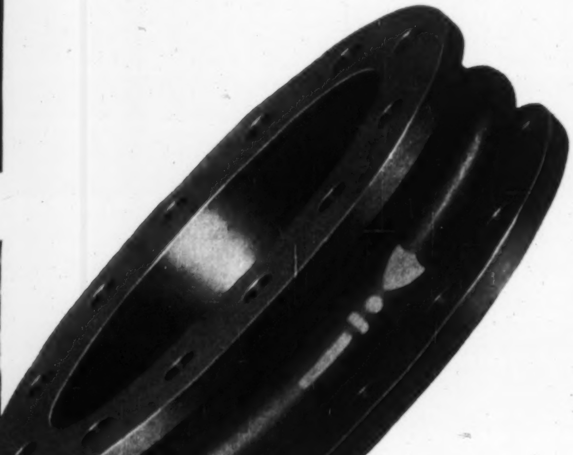


For the complete technical information catalogue on the entire line of U. S. Rubber Expansion Joints, contact your nearest "U. S." District Sales Office or write us at Rockefeller Center, New York 20, New York.

Mechanical Goods Division

United States Rubber

NOVEMBER 7, 1957

ENGINEERING
NEWS-RECORD

ENR survey finds the construction industry wants more men of management caliber, but . . .

Can Construction Be Taught in College?

By the addition to their civil engineering curricula of at most four subjects, practically all engineering schools could produce graduates who would be better qualified to fill the construction industry's need for executives.

This is the conclusion that stands out most clearly from a survey conducted by ENR to determine whether special courses now offered in construction engineering are producing the kind of men that the industry has said it needs.

Other survey conclusions:

- Students and graduates of the special construction courses seem to be enthusiastic over the program.
- Throughout the country, contractors, individually and through the Associated General Contractors of America, Inc., are encouraging and giving increasingly active support to the construction engineering programs and students.
- Despite the support given by the contractors through gifts and scholarships, the survey indicates that educators feel that many contractors fail to seek out these construction engineering graduates.

ENR sent its questionnaires to leading universities and colleges across the nation. Among 33 replies, 30.3% give an option in construction engineering, 48.5% do not and 21.2% did not specify. Of these, four give a degree in construction engineering, the rest in civil engineering.

Those schools giving the construction option offer many management and cultural subjects not considered regular and strictly technical civil engineering subjects. Generally, the option is administered by the civil engineering department. Subjects include: economics, law, public administration, labor relations, estimating, accounting—as well as a wide selection of electives.

Other schools do not give the construction option formally, but unofficially in the form of electives.

It was found also that 39.4% of all the schools replying have a curriculum that includes some, but not all, of the management subjects mentioned above.

And, practically all schools that do not offer an option in construction engineering would fall into the same category as those giving the option by adding a few subjects: principally, accounting, finance, administration and construction methods and equipment. If this were done then nearly 79% would be giving a construction course even though it were not named as such.

Some Take Five Years

Still other schools give special programs that go beyond the scope of an option. These are specialization courses such as given at Cornell, Stanford University or Texas A&M.

At Cornell, a five-year program provides the background for work in construction engineering. Educators believe this course is equal to or greater than that which is possible in a four-year college course, be it a special course in construction engineering or a construction option in a regular civil engineering course.

At Cornell, construction and management are treated as essential elements of civil engineering, at the same level as the more customary technical and cultural subjects. Only one degree, Bachelor of Civil Engineering, is offered.

Cornell's civil engineering curriculum is very similar to that suggested by W. A. Klinger of Sioux City, Iowa, a member of the Education Committee of the AGC. Mr. Klinger's suggested five-year program, which appeared in AGC's publication, THE CONSTRUCTOR, in January 1956, is compared with Cornell's in an accompanying box.

Some Make It a Masters

Another facet of the similarity can be seen at Stanford, which offers a construction course at the graduate school level. A Master of Science degree in civil engineering-construction is given to qualified students completing a total of 45 or more quarter units.

Stanford's graduate construction program actually began over 20 years ago. Prof. J. C. L. Fish, then head of civil engineering and Prof. Eugene L. Grant were aware that many civil engineers eventually were forced into administrative work. It was apparent that such men were badly handicapped, because they had no background in finance, accounting, law and the other subjects with which they had to deal.

To fill these gaps in engineering education Professor Grant developed a graduate program. It combined advanced work in technical subjects with administrative courses.

As a result, Stanford's undergraduate construction option was instituted in 1946. As at many other schools, the curriculum was conventional civil engineering, with courses in estimating, equipment and methods, business law, labor relations, and accounting—all substituted for technical electives.

Actually, the undergraduate construction courses drew several graduate students each year until 1955, when the number of students taking individual work had grown to a point that a series of graduate courses running through the school year were justified. Thus, the school now offers the degree of Master of Science in Civil Engineering-Construction.

It is reported that the university is convinced that the program is worthwhile. The most enthusiastic supporters are the graduates of the last 10 years, who now hold responsible positions in the construction industry, or who are themselves contractors. Also many executives in large West Coast construction firms have stated that men with the added training will be much more valuable to them.

"No single group of courses can properly cover all the areas of importance for any industry as diversified as construction," stated Stanford's Prof. C. H. Oglesby. "In our opinion a flexible program provides the only means by which the student can use his time to best advantage." He continued. "**We are also convinced that training for management is more important in construction than is technical competence in advanced engineering subjects.**"

Some Wed to Business

During the year 1956-57, Texas A&M College adopted a plan for including courses in civil engineering with a course in business administration, to give a five-year curriculum.

Degrees of Bachelor of Science in Civil Engineering, and Bachelor of Business Administration are offered.

According to Prof. R. L. Peurifoy, who is also a member of the joint committee on education of the AGC and the American Society for Engineering Education, this was primarily to train men for greater service to themselves and to the construction industry.

According to A&M officials, "This option will grow in numbers of colleges offering it, and in strength and usefulness to the student and the construction industry. There will ultimately be departments of construction engineering in many of our engineering colleges giving not options but degrees in construction engineering. After all, the construction industry is the largest in the nation and deserves this service from the educational institutions."

The professors and students of the three schools mentioned above are naturally enthusiastic over their respective programs.

However, the majority of the schools reached in ENR's survey made it clear from their responses that they feel that there is no need for five-year courses; that, merely by adding the few subjects now lacking, they would in effect be offering the equivalent of a four-year construction engineering course.

The tendency then would not be the institution of special departments or new courses of the five-year type, but the adaptation of the existing civil engineering curricula.

Others Against Change

The typical view is that expressed at the University of Missouri: "No special option or curriculum is needed. Give a Bachelor of Science in Civil Engineering degree, taking at least one construction and one management course. Management courses . . . can be given in the civil engineering department."

The University of Mississippi, which abandoned its construction program some four years ago, reports that specialization in any particular division of civil engineering was becoming "hopeless." The demand from the best contractors was for well rounded engineers. This need had been apparent, according to Dean F. H. Kellogg, not only in construction engineering but also in structural engineering. "The complete ignorance of so many civil engineers of anything outside the basic realm of statics has led to all sorts of impossible or impracticable designs, litigation and unnecessary expense on job after job," the school commented.

As the parallel requirements of civil engineering, whether in structural, sanitary or construction, became more and more apparent, Mississippi decided to give no options, but rather a broad basic education in general civil engineering, with application to construction considered one of the fundamentals for all civil engineers.

At Mississippi, all civil engineers are now required to have a broader basic engineering education, utilizing virtually all of the engineering sciences. A man may choose six to nine hours of electives in fundamentals to give somewhat of a construction slant, rather than design slant, to his program. Nevertheless, all engineers have some structural work as well as some training in applications of dynamics, thermodynamics, heat transfer, electricity and other engineering fundamentals.

"In our experience, there is more demand, from the construction industry and from related fields of design for more broadly trained people than there was for a very narrow construction option," said Dean Kellogg.

Prof. R. E. Fadum, head of North Carolina State's civil engineering school commented that construction is merely a "production function" of civil engineering, as it should be. "Furthermore, it is the student himself who is important," he added.

Employer Reaction

To the question, "Do contractors prefer or seek out graduates of the construction engineering option course?" 43% of the schools said no; 28.5% said yes, 28.5% did not specify.

The fact that construction engineering courses are comparatively new probably explains this finding. Actually, it was not until after World War II that large-scale attention was directed to the problem of educating engineers for the construction industry. It also appears that it is the individual who is hired rather than the graduate of the course—thus a good civil engineering student would be preferred over a mediocre construction option student.

Asked whether contractors in their areas are actively participating in the construction engineering program, 13.3% of the educators said no, 33.4% received some help, while 40% declared that considerable active cooperation was noted. The remaining 13.3% did not indicate.

This general view is held by the contractors.

At the 36th annual AGC convention (1955) the education committee said: "Special construction courses offered by engineering colleges should supplement, and not replace, the basic civil engineering courses."

D. W. Winkleman of Syracuse, then committee chairman, commented:

"The education committee would like to go on record that they are not opposed to an engineering school offering an engineering degree in construction. But they do believe it will be to the advantage of all concerned if the desired construction courses can be offered by the civil engineering department along with the regularly required courses resulting in a degree in civil engineering."

AGC's Current View

John E. Healy, II, of Wilmington, present chairman of AGC's education committee, believes that men who will serve the construction industry should have a five-year course and should definitely get a civil engineering degree. Perhaps a second degree—a masters—can be offered for the fifth year.

"The extra year," said Mr. Healy, "would make possible the inclusion of subjects such as business administration, estimating, plant layout, earthworks, cost analysis, contract law, and bidding procedures. The graduating engineer would thus be rounded out in administrative as well as in technical ability—and familiar with the humanities. One constant complaint is that engineers are too technical or strictly concerned with design, not enough with people. And the handling of people is perhaps the executive's most important job."

(Claiming a deficiency in engineering education, at least one big construction firm has established an extensive training program. It's Perini Corporation—see p. 145.)

Another complaint, said Mr. Healy, is that a great many students are not prepared for engineering school upon leaving the high schools. The numbers that fail in the freshman year is high. This situation is not occurring because there is a lack of mental ability but, because they are weak in the basic sciences that should be understood at the high school level. Many students must spend part of their freshman year making up high school subjects.

To counter this situation, AGC's education committee is pushing the production of a 20 minute color film to be used in a special campaign to interest young people in a career as a construction engineer.

The contractors will continue to investigate, encourage and talk with universities regarding more specialized training for construction engineers. The courses suggested by Mr. Klinger will be the goal.

And to provide better prepared students for the universities the AGC will investigate the status of high school curricula to learn where and how aid can be given.

How They Compare

Cornell's Civil Engineering curriculum and Mr. Klinger's curriculum for a degree of Construction Engineer.

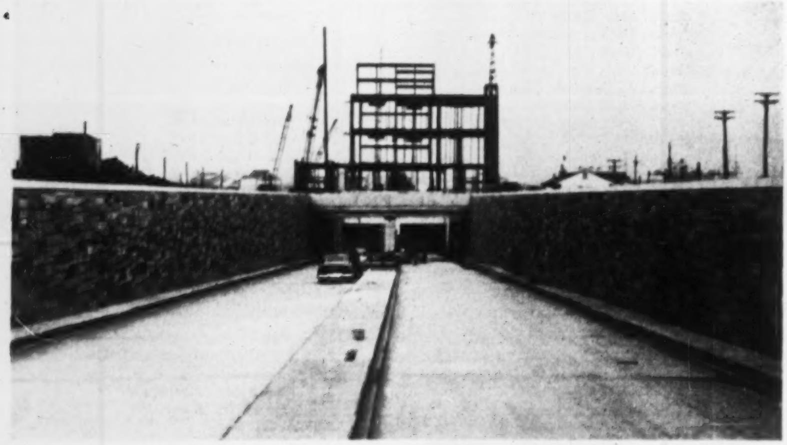
	Cornell	Hrs.	Klinger
Term 1	Math (Anal. Geom. & Calculus)	3	Math (Algebra & Trig.)
	Physics—(Mech)	3	
	Chem.—(Gen'l)	3	Chem.
	English	3	English
	Dwg.	3	Eng. Dwg.
	Orientation No credit	(1)	Eng. Orient.
	ROTC " "	(2)	
	P.T. " "	(1)	Social Science
Term 2	Math (Anal. Geom. & Calculus)	3	Math (Anal. Geom.)
	Physics (Wave Motion, Sound, Heat)	3	
	Chem (Gen'l)	3	Chem.
	English	3	English
	Dwg. Incl. Descript. Geom.	3	Eng. Dwg.
	Surveying Elementary	2	
	ROTC (No credit)	(2)	Eng. Orientation
	P.T. (" ")	(1)	Social Science
Term 3	Math Anal. Geom. & Calculus	3	Math (Calculus)
	Phys. Elect. of Magnetism	2	Physics
	Chem. Organic	2	
	Geology Engineering Geol.	3	Geology
	Surveying Advanced	3	Surveying
	Mechanics Statics	3	Mechanics (Statics)
	ROTC (No credit)	(2)	
	P.T. (" ")	(1)	
Term 4	Physics Phys. Electronics, Optics	2	Physics
	Chem Phys. Chem.	2	
	Economics Modern Eco. Society	3	Economics I
	Surveying Route, Arial	3	Surveying (Advanced)
	Mechanics Dynamics	3	Mechanics (Dynamics)
	Strength of Matls.	3	
	ROTC (No credit)	(2)	
	P.T. (" ")	(1)	Math (Calculus)
Summer	Surveying Camp		Work in field—prefer basic trade
Term 5	Strength of Matls.	3	Same
	Materials—Metals	3	
	Fluid Mechanics	3	Same
	Microbiology in Eng.	3	Same
	Structural Analysis (Elementary)	3	Same
	Transportation	3	Construction Methods Accounting
Term 6	Construction Methods	3	
	Applied Hydraulics & Hyrology	3	Same
	Accounting	3	Accounting
	Steel & Timber Structures	3	Same
	Applied Mathematics	3	Same
	Soils Engineering	3	Same
			Engineering Matls
Term 7	Engineering Matls.	3	Same
	Adv. Struct. Analysis	3	
	Water Supply & Treatment	3	Same
	Reinforced Concrete Design	3	Reinforced Concrete Design
	Engineering Law	3	Same
	Elective (Socio-Economic)	3	Structures Eng. on Bldg. Constr.
			Eng. Reports
			English Composition
Term 8	Hydraulic Engineering	3	Same or Special Probs. in Bldg. Design
	Sewerage & Sewage Treatment	3	Same Meth. & Mat'ls of Bldg. Constr.
	Foundations	3	Foundations
	Highway Engineering	3	
	Economics of Engineering	3	Same
	Public Speaking	3	Pub Speaking, Stat. Indet. Struct.
Term 9	History of Science in Western Civilization	3	Same
	Structural Design	3	Same
	Heat Power I	3	
	Electrical Engineering	3	Same
	Elective Free	3	Elective—"suggestion"
	Elective Free	3	Economics of Constr., Lab. Rel in Const
Term 10	Heat Power	3	
	Electrical Engineering	3	Same
	Public Administration	3	
	History of Science in Western Civ.	3	Same
	Industrial & Labor Relations, Survey of	3	
	Elective Free	3	Elective—"suggestion"
	Elective Free	3	Elective

November is a month for openings as . . .

Three Traffic Links Go Into Business

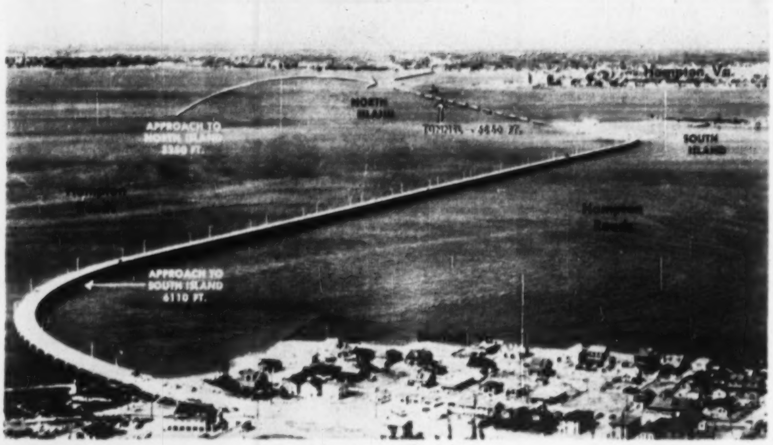
Three major traffic facilities will join Michigan's spanking new Mackinac Bridge (ENR Oct. 31, p. 24) in opening for vehicular business this month. On the list with the new bridge are the following:

The 3½-mile-long Hampton Roads Bridge-Tunnel which links Norfolk, Va. with Hampton, Va.; Baltimore's 6,300-foot-long Patapsco Tunnel which will reduce the driving time required to pass through the city; the final 15½ miles of the 110-mile-long Northeast Extension of the Pennsylvania Turnpike which links the Philadelphia metropolitan area with the industrial, farming and Pocono Mountain resort sections of northeastern Pennsylvania.



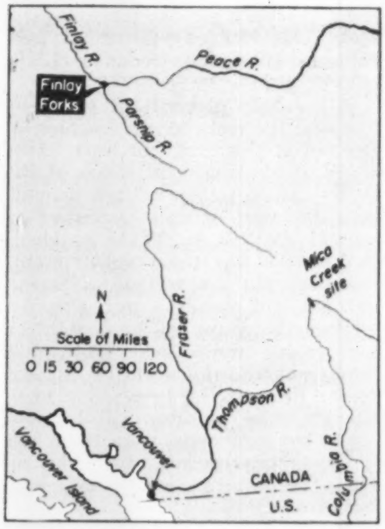
THE PATAPSCO TUNNEL will be ready for opening on Nov. 30. This trench-type tunnel is the biggest construction project ever undertaken in Maryland. The twin-tubed, $130 million artery, in connection with its approach roads, will provide for the first time a fast route for north-south traffic through the heart of Baltimore. The tube was designed by the New York consulting firm of Singstad & Baillie and built under contract to Merritt-Chapman & Scott.

HAMPTON ROADS BRIDGE-TUNNEL was opened on November 1. The two-lane tunnel, the world's sixth longest subaqueous crossing, is part of a project that includes two low-level approach bridges and two man-made islands that form the portals of the tunnel. Built by Merritt-Chapman & Scott Corp. of New York, to designs proposed by Parsons, Brinckerhoff, Hall & Macdonald of New York, the tunnel is a key segment in the Virginia Department of Highways' plan for a 27 mile road improvement in the area.



Pennsylvania Turnpike Commission photo

THE NORTHEASTERN EXTENSION of the Pennsylvania Turnpike is now complete with the opening today of the final 15½ mile segment. The photo at left is of the 1,627-foot-long Clarks Summit bridge as it crosses the tracks of the Delaware, Lackawana and Western Railroad and U.S. Routes 6 and 11; in the foreground (right) the Scranton Interchange—final point of exit and entrance of the new extension—and the road's convergence (left) with U.S. Routes 6 and 11.



Triple Power Play

Two new British Columbia power schemes provide grist for speculation mill

A 3 million kw hydro scheme, on the Peace River, estimated to cost between $400 and $600 million, was announced recently by British Columbia Premier W. A. C. Bennett. Just a few days before, British Columbia Electric Co. announced that it intended to build a 900,000 kw thermal plant in the Vancouver area.

The two new schemes (neither is firm) stem directly from failure thus far of Washington and Ottawa to reach agreement on the use of Columbia River waters for the long-proposed 1.1 million kw Mica Creek development. They reflect the anxiety of British Columbians to assure sufficient power to meet demand in the Vancouver area in the 1960's.

Both the premier and BCE officials clearly implied, however, that Mica Creek was the most desirable initial development, and that their plans would be deferred if Mica Creek were started.

Of the two new proposals, the electric company's is the more immediate. BCE is talking about starting construction in the next few months and commencing initial generation of 75,000 kw by 1960. The entire 900,000 kw plant, estimated to cost in excess of $100 million, would take seven years to complete.

But company spokesmen were loathe to talk beyond 1960. Perhaps power would yet win out over fish in Fraser River; international agreement on Mica Creek would be reached; or atomic power would be competitive.

Fuel that would be used by the steam plant is also a subject of speculation. Three possibilities: natural gas, oil or coal from recently discovered deposits of lignite near Pavillion.

The huge hydro scheme on the Peace River attracted Swedish financier Axel Wenner-Gren, who has contracted with the British Columbian government to complete final surveys and preliminary plans by 1960.

Contemplated is a dam, or series of dams, near Finlay Forks on the Peace River. Peace River waters flow northeasterly into the Mackenzie River, thence into the Arctic Ocean. A lake 260 miles long and 10 to 15 miles wide would be formed.

Premier Bennett stressed that the project does not rule out Mica Creek Dam and other Columbia River hydro projects. It would mean, said the premier, that the "development of British Columbia won't be held back while Ottawa and Washington hold pink teas" trying to settle downstream benefits of the Columbia River.

Site Clearing to Start For 40 Story Building

Demolition crews will start making way in Los Angeles in a few weeks for erection of the 40 story Freeway Center Building, tallest building on the West Coast.

Construction of the $23.8 million project will probably get under way late next year. The site borders the city's Harbor Freeway.

Offices of the transportation industries and financial institutions will occupy the building's 720,000 sq ft of space. Office space will be air-conditioned by a high-velocity system. Enclosed parking for 1,000 cars will be provided on five levels.

Richard L. Dorman & Associates are architects of the building. L. T. Evans, of Los Angeles, is consulting engineer on soils and foundations. John M. Stahl, of Los Angeles, is the developer of the project.

PETER F. CONNOLLY
. . . A charter member

FRANCIS DONALDSON
. . . A non-member

Moles Name Their 1958 Awardees

Two old-timers who have been in heavy construction—largely tunnels—for a total of more than 110 years were named this week to receive the 1958 Moles Awards.

The awardees' identities were revealed at the members dinner of The Moles, New York organization of heavy construction men, and the awards will be made at their award dinner in New York City next Jan. 29.

Peter F. Connolly, winner of the member award, has been in tunnel and pneumatic caisson work since he first went to work in Boston in 1902. He started his own business in 1908 and has built subways, major water tunnels and difficult bridge foundations—and recently, spectacular piers for the Harlem River railroad crossing in New York City.

He makes Osterville, Mass. (on Cape Cod) his headquarters.

Francis Donaldson, the non-member to be honored in Mole tradition this year got out of Lehigh University and began his career in heavy construction with Frank Dravo in 1901 became chief engineer of Dravo Contracting in 1908. His work for Mason & Hanger on foundations for the New Jersey tower of the George Washington Bridge in 1926 and his part in East River subway tunnels, the Lincoln Tunnel and the Brooklyn-Battery Tunnel (all in New York) led him to his present position as vice president and director of Mason & Hanger and Silas Mason Co.

Flow Is Improving

Aluminium Ltd. explains Kemano tunnel friction

The Aluminum Co. of Canada, principal subsidiary of Aluminium Ltd., feels a lot better about its 10 mile power tunnel at the Kitimat project in British Columbia; its flow is improving steadily. A year and a half ago there were fears that a serious obstruction might have developed in the unlined, 25 ft dia tunnel (ENR June 21, 1956, p. 17).

Last week an official of Alcan gave ENR this statement:

"When sufficient water was flowing through the Kemano tunnel to permit an accurate measurement of tunnel resistance, the measurements indicated a resistance coefficient considerably higher than that for which the tunnel was designed. The outstanding possibilities were an air lock or rock fall in the tunnel. A tunnel inspection was planned. However, when the next generating unit was put on power and the flow through the tunnel thereby increased, the coefficient of resistance decreased. Similarly, on each occasion that a further unit has gone into service and the tunnel flow increased, the coefficient of resistance has also decreased until now the tunnel resistance measurements indicate no serious obstruction.

"From a searching study of observable conditions, our consulting engineers, Ebasco Services Inc., soon reached the conclusion that air along the crown of the tunnel was the probable cause of the observed excessive head losses, although it was not then possible to rule out completely the possibility of a rock fall. Our own engineers also incline to that theory. However, we would prefer to delay any definite statement on the subject until at least one of the remaining two units to be installed in the first phase of the Kemano powerhouse is in operation. It seems possible that eventual measurements will indicate a tunnel coefficient of resistance even lower than the original design figure. We are contemplating an engineering paper on this subject in due course."

TV Tower Plans

January start expected on fallen tower replacement

Station WSM-TV, Nashville, expects to begin construction about Jan. 1 on a new 1,252 ft television transmission tower to replace the one that collapsed while still under construction last February, killing four workmen (ENR Feb. 14, p. 24).

It had been planned last spring to complete the replacement structure by the end of this year, but legal action aimed at blocking construction of the facility caused station officials to postpone the start of work, according to John H. DeWitt, Jr., WSM president.

Why the first tower failed is still unknown, but design changes in the new one will provide a greater reserve of strength. Guys will be doubled in number and stressed more lightly, and lower working stresses will be assigned to the tower steel. Low-carbon high-strength alloy probably will be used again, but final decision on this point has not been reached. Including antenna, the structure will attain a total height of 1,368 ft.

A lawsuit to prevent erection of the tower on the grounds that it will be a nuisance is pending in chancery court in Nashville. The plaintiff, who lives near the site and claims that the structure will endanger his home and family, already has been refused a temporary injunction that, if granted, would have barred work on the project pending a court decision. Encouraged by the court's preliminary action, WSM is going ahead with the job.

Still under contract to WSM for the entire transmission facility—including tower, building and antenna—is General Electric Co. Blaw-Knox Co. holds the subcontract for the tower. No erection subcontractor has been announced. WSM has retained in an advisory capacity a New York City firm of consulting engineers, Edwards & Hjorth, not connected with the project originally.

Water Data Sought

Kentucky survey will be a county-by-county project

A broad survey of the state's water problems will be made by the state of Kentucky and its Citizens Water Policy Committee during the next two months. The purpose of the county-by-county study is to gather information for a possible law governing conservation and use of the state's water supply.

Questionnaires are to be mailed to members of each of 120 county water committees, whose chairmen are the county judges. Information will be gathered through mass meetings and the data returned to the conservation department in Franfort.

The fact-finders are instructed to list the time, place and nature of all instances of water problems be they of excess or shortage.

Skyscraper Gets First Gold Colored Panels

Installation of gold-colored aluminum panels has been started on the exterior of a 34 story office building in New York City.

The building at 575 Lexington Ave., (51st St.) in midtown Manhattan, will be enclosed with 100,000 sq ft of the panels. Both spandrels and window units have a matte finish resembling old gold. The mullions, with a reflective finish, are a lighter shade of gold.

The color was applied to the aluminum surface in the anodizing process, an inorganic dye becoming a part of the metal as a hard coating of aluminum oxide formed. This is the first application of gold-anodized aluminum for buildings.

Sylvan Bien and Robert Bien, New York City, are the architects. Sam Minskoff & Sons, Inc., is the builder, and F. H. Sparks Co. is installing the panels, which were produced by Reynolds Metals Co.

What's in a Name?

Surveyors are engineers says ASCE task committee

Land surveying should be considered a branch of the engineering profession, proposes the task committee on surveying and mapping of the American Society of Civil Engineers in its second interim report.

The committee, after evaluating responses from engineers and surveyors to its first interim committee report (ENR Mar. 21, p. 34), reversed its original stand in regard to the status of land surveyors. The committee now recommends that land surveying be considered a function basically engineering in nature. This interpretation of status would thus group surveyors of all types into a unified surveying profession, properly falling into the broader category of civil engineering.

One reason for the proposal is to promote unity in the surveying and engineering fields. The committee feels that this proposal would act to develop a surveyor-engineer—one qualified to do not only property work but also whatever surveying might be needed in any engineering endeavor.

Another reason is to promote the teaching of surveying subjects in engineering colleges. For any profession to exist and continue, a body of professional knowledge must be imparted to the members. Yet in the past 20 years the engineering colleges have almost completely dropped the property surveying courses from their curricula. The consequence of such a drying up of sources of ideas and manpower from the colleges has been a reliance by surveyors on the apprentice system of training.

• **How to do it**—The committee proposes the land surveyor identify himself with—not disavow himself from—the engineer. By such identification the surveyor would be looking to a self-policing, ethical group instead of to the law to "protect" himself. And there should be no controversy about who would be allowed to do this or that task—any more than there is in any unified professional group.

A changeover from separate to combined registration would be the key to this unity. Gradually the examination coverage could be extended to include topographic & hydrographic surveys, site investigation, construction surveys, etc. In time, ultimate amalgamation of the two examining boards would bring about unity of the professions while the safeguards to the public welfare would be maintained.

• **The committee's stand**—The task committee states:

- Modification of present registration laws and additional or altered engineering courses are needed to assure the surveyor a professional status.
- The practice of education of land surveyors through an apprentice system and licensing them to operate in a narrow field is outdated and should be abolished eventually.
- Elective courses in the engineering curricula should offer more training in the professional and legal phases of land surveying.
- Training in junior colleges, technical institutes, and through university extension services should be offered students and surveyors-in-training otherwise unable to attend regular engineering colleges—until such time as it is possible to abolish separate registration of land surveyors.

To assist the task committee in preparing its final report it is requested that members of the civil engineering profession—both surveyors and engineers—comment on these latest proposals. After further discussion of the proposal during the ensuing months, in light of surveyors' and engineers' comments, a final report will be submitted.

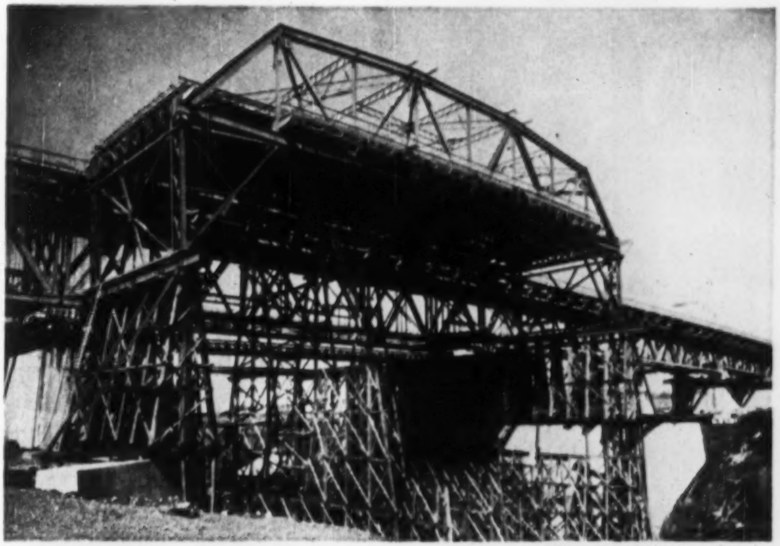


Photo by Hans van der Aa

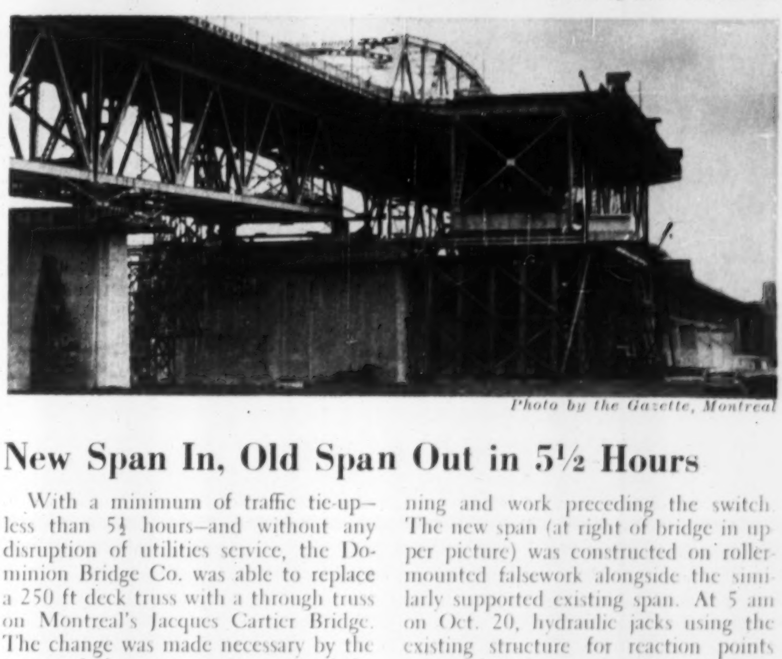


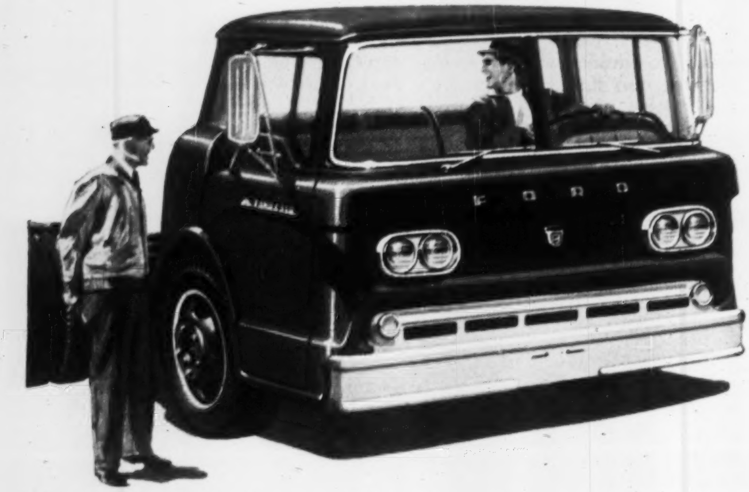
Photo by the Gazette, Montreal

New Span In, Old Span Out in 5½ Hours

With a minimum of traffic tie-up—less than 5½ hours—and without any disruption of utilities service, the Dominion Bridge Co. was able to replace a 250 ft deck truss with a through truss on Montreal's Jacques Cartier Bridge. The change was made necessary by the increased clearance requirements of the St. Lawrence Seaway (ENR Aug. 15, p. 52).

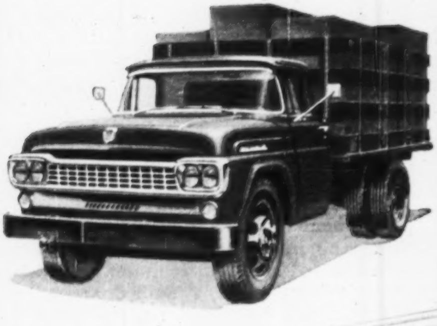
The ease and speed of the changeover is evidence of the months of planning and work preceding the switch. The new span (at right of bridge in upper picture) was constructed on roller-mounted falsework alongside the similarly supported existing span. At 5 am on Oct. 20, hydraulic jacks using the existing structure for reaction points started the simultaneous sideward movement of both spans. At 10:30 am the old span was out (at right in lower picture); the new span in, and traffic was rolling again.

Step in... NEW '58

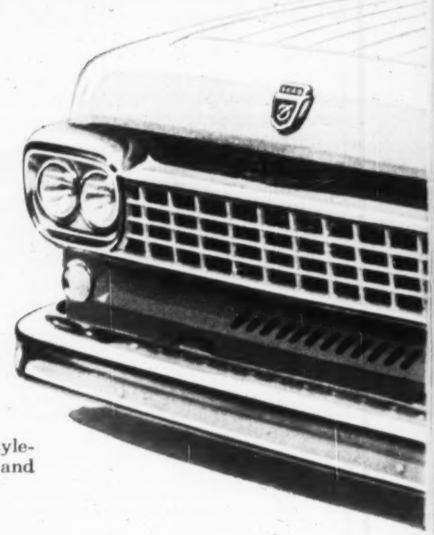


NEW TILT CAB TRUCKS . . . lowest-priced* Tilt Cab line in America! Six new series, up to 60,000-lb. GCW, are typical of the wide choice in Ford's heavy duty line.

**Based on a comparison of manufacturers' suggested retail prices*



(Background) **NEW TWO-TON** stake with your choice of Short Stroke Six or V-8's.



NEW '58 FORD PICKUP. Modern Styleside body is as wide as the cab and *standard at no extra cost!*

Step ahead... with all

Meet America's newest, most modern trucks—Ford for '58! Discover the new advances in this pace-setting line. See the important advantages that help you do your job better and at lower cost!

Then match your specific requirements against Ford's over 300 new models. Whatever your need—from half-ton pickup to heavy duty tandem—Ford's got it! And *you'll* get a truck that costs you less to own, less to run and lasts longer, too.

So see your Ford Dealer today and step ahead with America's most modern truck—built modern to cost you less.

NEW CAPACITY! Extra-wide Styleside pickup bodies have up to 41% more loadspace than others . . . *biggest loadspace per dollar!*

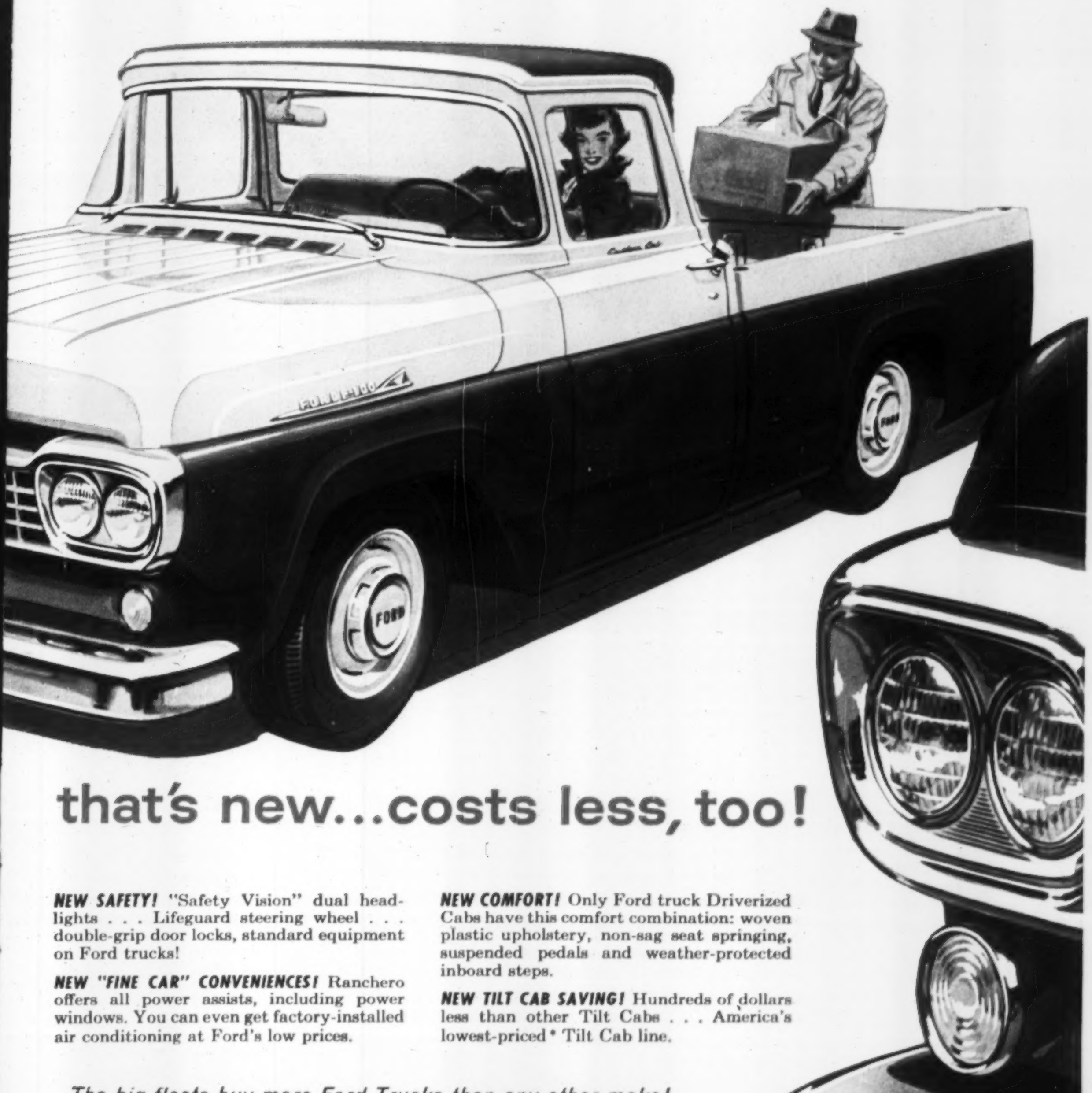
NEW SAVINGS! Only Ford offers this modern, extra-capacity pickup body *at no extra cost!*

NEW EASY RIDE! Scientific Impact-O-Graph ride tests prove amazing superiority of Ford over competitive pickups—a ride mighty close to that of a car!

NEW POWER! More powerful, more rugged V-8 engines! And only Ford offers Short Stroke economy in *both* Six and V-8!

'58 FORD TRUCKS—FIRST WITH THE FEATURES THAT COUNT!

FORD TRUCKS



that's new...costs less, too!

NEW SAFETY! "Safety Vision" dual headlights . . . Lifeguard steering wheel . . . double-grip door locks, standard equipment on Ford trucks!

NEW "FINE CAR" CONVENIENCES! Ranchero offers all power assists, including power windows. You can even get factory-installed air conditioning at Ford's low prices.

NEW COMFORT! Only Ford truck Driverized Cabs have this comfort combination: woven plastic upholstery, non-sag seat springing, suspended pedals and weather-protected inboard steps.

NEW TILT CAB SAVING! Hundreds of dollars less than other Tilt Cabs . . . America's lowest-priced* Tilt Cab line.

The big fleets buy more Ford Trucks than any other make!

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

This Truck is "All Shook Up" by a field-rebuilt, unbalanced clutch

The owner is "shook up," too. Three months ago, he installed a *field*-rebuilt clutch bought "at a price." Now, it has failed . . . and with it the crank-shaft, throwout and main bearings. A complete overhaul of drive-line components, from crankshaft to differential is necessary.

Just 3 Inch-Ounces of Unbalance Caused the Damage!

Unfortunately, you can't detect such a small unbalance without sensitive testing machinery. Just a few dollars more for a genuine Lipe Guaranteed Clutch at the time of replacement would have insured the owner the use of such factory equipment . . . and saved him a $500 to $800 overhaul job on his truck today. Here's why:

9 out of 10 Rebuilders Are Not Equipped to Balance a Clutch Properly

Adequate testing machinery – much of it electronically equipped–is expensive. The field rebuilder usually doesn't have it. Many of them "make do" with something less.

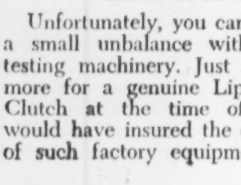
All Parts in All Lipe Clutches Must Conform to the Same Material and Precision Standards

From our experience in supplying clutches to 54 makers of heavy-duty equipment, comes the know-how that goes into the manufacture of the Lipe Guaranteed Clutch. That is why we can unconditionally guarantee our product to be unequalled by field rebuilders.

Look for this red and white Factory Seal when you take delivery on a Lipe Guaranteed Clutch for replacement service. It is your assurance of long, trouble-free life and *big* long-run savings!

SEND FOR OUR FREE "Clutch Facts" Booklet

Tells how to get more life from your heavy-duty clutches and what to look for when replacing them.


Find Your Nearest Dealer In The Yellow Pages

Lipe-ROLLWAY
CORPORATION
SYRACUSE 1, N. Y.

Briefs

• Air Force Academy—Construction work on the new Air Force Academy near Colorado Springs, Colo., is reported to be slightly ahead of schedule. This is in contrast with last spring, when weather and labor disputes slowed construction. To date, more than $104 million of the $133½ million authorized by Congress is under contract, and by January, 1958, about $60 million worth of construction will be completed. The Academy is expected to handle its first class in September, 1958.

• Pollution control board—Four vacancies on the Water Pollution Control Advisory Board—which advises the U.S. Surgeon General on policy matters relating to administration of the Federal Water Pollution Control Act of 1956—have been filled by the recent Presidential appointments of Irwin T. Bode, Jefferson City, Mo.; Mayor William F. Duckworth, Norfolk, Va.; Dr. Harold M. Erikson, Portland, Ore.; and Anton Hulman, Jr., Terre Haute, Ind.

• Solar house design winner—Winner of the international solar house architectural competition sponsored by the Association for Applied Solar Energy is Peter R. Lee of Minneapolis. Mr. Lee, a senior in architecture at the University of Minnesota, received $2,500 for his design. He will supervise the house's construction at Scottsdale, Ariz.

• Pittsburgh Gateway Center—Construction of a fourth skyscraper office building at Gateway Center in Pittsburgh will be started within six months. The structure will be 22 stories high and provide over 400,000 sq ft of floor space. Harrison & Abramovitz, architects, New York City, has been retained by the Equitable Life Assurance Society to design the building. It is expected to cost about $15 million and be opened in 1960.

• Industrial Door Council—Aircraft hangar and industrial door manufacturers have formed the Hangar and Industrial Door Technical Council. Purpose of the council is the preparation of recommended standards for the industry. One of the first objectives is establishment of commercial standards for all types of hangar and industrial doors.

• Aluminum dome—Kaiser Aluminum & Chemical Corp. has contracted to build an aluminum dome 145 ft in diameter and 49 ft high, to enclose a manufacturing plant for the Fi Fo Conveyor Co. at Abilene, Kan. The dome, similar to those built by Kaiser to house auditoriums, will be used to produce pneumatic granular conveying systems.

Bulk Chemical Storage by the SAUERMAN Method

Reclaiming Triple Superphosphate to Hopper

Overall View of Storage

How Sauerman Scraper Storage Reduces Costs

200,000 tons of triple superphosphate are produced each year in this new Florida plant. It is delivered by overhead conveyor to a 329′ x 146′ storage building of 35,000 ton capacity. The material is then stockpiled and reclaimed by a 2½ cu. yd. Sauerman Scraper at a rate of 150 tph.

Here's how a Sauerman Machine Cuts costs:

One operator, located in a safe station overseeing the entire area, can recover practically 100% of all stockpiled material.

All highly machined parts, hoists and motors can be located outside of the building and protected from corrosion and dust.

When parts are replaced—sheaves, clutch or brake linings—the machine is restored to practically new condition, even though it may be twenty or more years old.

Only the Crescent scraper and cables contact the material. The scraper machine can be designed to operate the scraper on top of non-caving material. This allows the scraper to break down any high faces that may be standing.

Sauerman Storage Machines are built for hourly capacities of from 20 to 600 cu. yds. A partial list of producers and manufacturers using some type of Sauerman equipment includes:

Consumer Cooperative Assn.
Crawford Chemical Co.
Davison Chemical Co.
  Division of W. R. Grace & Co.
Duval Sulphur & Potash Co.
F. S. Royster Guano Co.
International Minerals & Chemical Corp.
Lion Oil Co.
Potash Company of America
Tennessee Farmers Cooperative
Virginia-Carolina Chemical Corp.
Southern Agricultural Fertilizer Co.

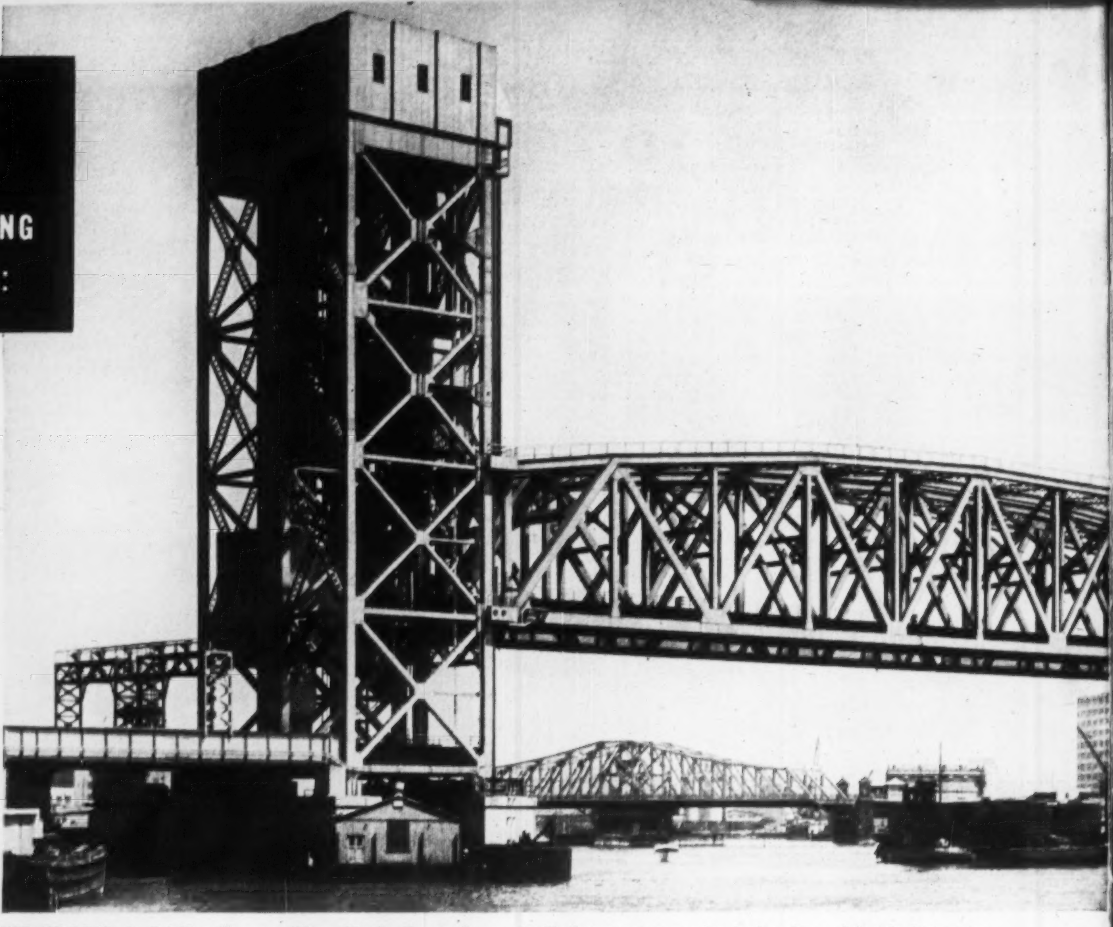
For ways to reduce your material handling costs, write to Sauerman's experienced engineers. Request Catalog E, *Bulk Storage by DragScraper*, plus Field Reports on the handling of your material by Sauerman Machines.

SAUERMAN BROS., INC.

632 SO. 28th AVE.
BELLWOOD, ILL.
Cable CABEX—Bellwood, Ill

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

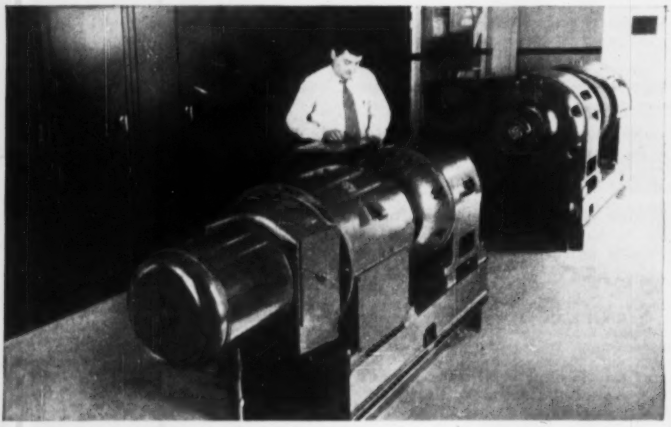
ENGINEERING REPORTS:



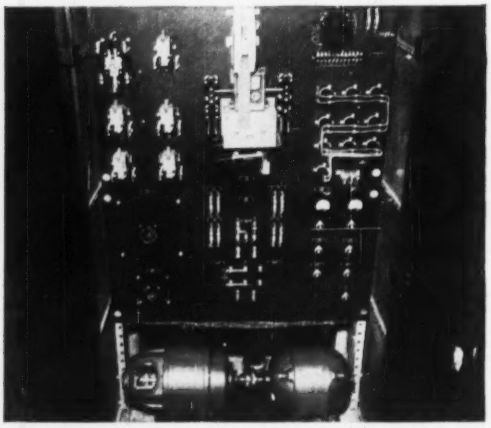
500 TRAINS A DAY roll over New York Central System's new Harlem River lift bridge in New York City. Reliable General Electric ***amplidyne-controlled*** system permits balancing of loads between tower drives. These tower drives provide accurate alignment of spans while moving and during seating.

Powered by reliable G-E amplidyne drive system . . .

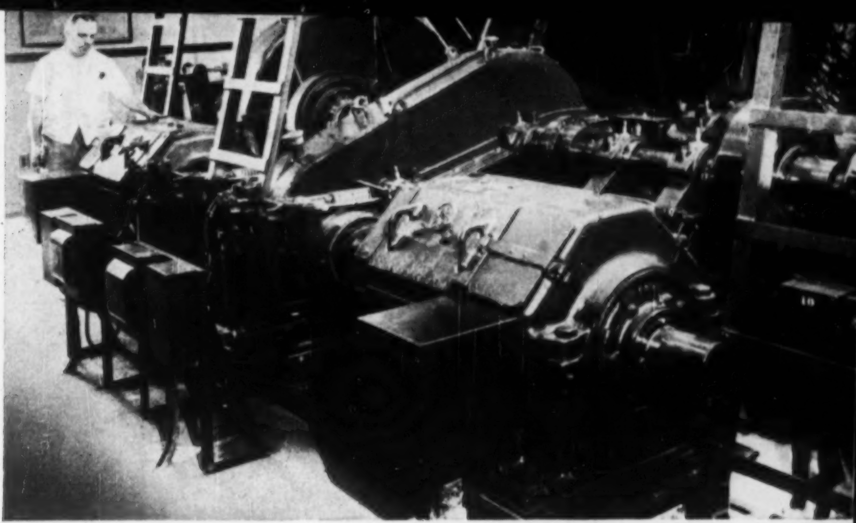
Vital N. Y. Central lift bridge carries 500



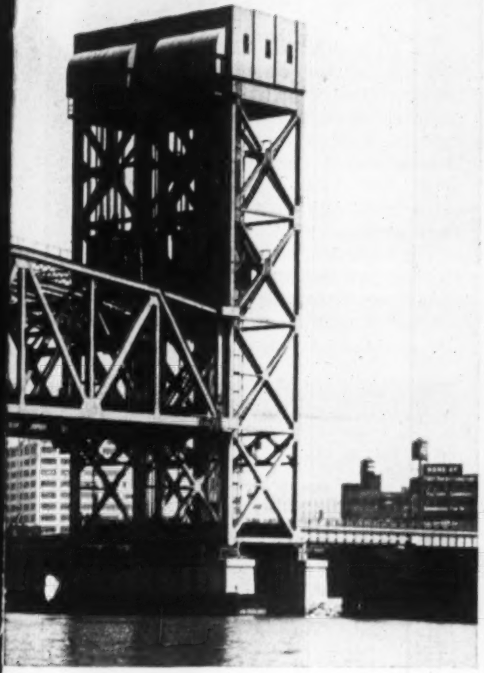
EMERGENCY POWER is provided by 50-kw G-E motor-generator set (foreground) and a small submarine cable tied to two power sources. Main General Electric motor-generator installation (rear) is rated 150-kw, supplies d-c power to drive motors. Continuous circuit adjustment helps reduce stresses on machinery, cables, and lengthens drive equipment life.

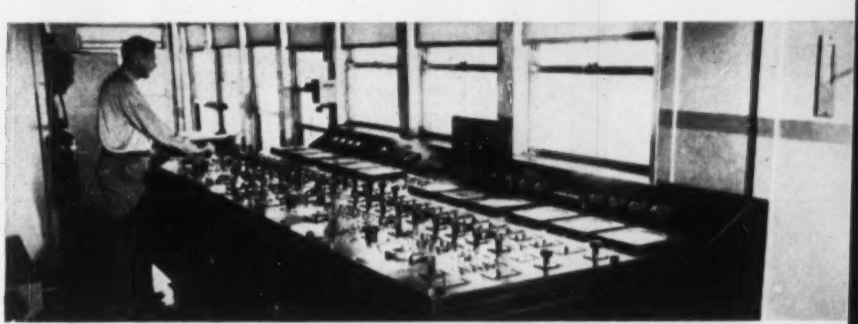


INSTANT RESPONSE and high amplification factor are two ***amplidyne*** features that help provide pin-point control of motor speed, torque output regardless of load variations. Built-in characteristics enable ***amplidyne*** to deliver reliable performance over long periods.



RUGGED 230-HP D-C DRIVE MOTORS raise two 1600-ton spans 110 feet within 90 seconds! Flexibility, reliability features of d-c motor, plus ***amplidyne's*** instant response and high amplification factor help provide maximum torque output quickly, smoothly.





PRECISE CONTROL of all bridge operations—lifting, lowering, seating—is centralized in a General Electric equipped master control station. Two separate power sources, one on each side of the Harlem River, are utilized to drive the bridge's span lifting mechanisms.

trains a day across busy Harlem River

General Electric equipment raises, lowers, seats two 1600-ton spans rapidly, smoothly, without rebound

New York Central operates 11,000 miles of railroad, providing fast, efficient service from the Atlantic Seaboard to the Mississippi Valley. Mainstay of this route structure is Central's main artery into the heartland of the Midwest.

VITAL LINK for passenger train service in this artery is a new 14,000-ton double lift bridge over the Harlem River in New York City. One of N.Y. Central's heavily-trafficked track sections, this bridge carries 500 commuter, through trains daily, plus switching operations. The busy waterway below handles heavy barge, freighter traffic.

FOR ALL-WEATHER OPERATION, a G-E amplidyne-controlled drive system was selected for fast, precisely-controlled lift performance. This system, applied to key bridges since 1949, raises two 1600-ton spans 110 feet within 90 seconds, and lowers, seats them smoothly, without rebound. The amplidyne's high amplification, instant-response features enable rugged G-E d-c drive motors to deliver smooth, peak performance regardless of load variations.

MAINTAINING TRAFFIC FLOW required careful project planning at all stages of construction. Working closely with N.Y. Central engineers, project contractors and consultants*, G-E engineers followed a strict schedule for delivery, installation, startup of electric equipment.

TO HELP YOU on your next construction project, General Electric offers expert technical assistance and system-engineered equipment for your electric system needs. For more information, contact your G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N.Y. 664-47

*General Contractor: Walsh Construction Co. and Peter F. Connolly Co.; Senior & Palmer Co.
Steel Superstructure: American Bridge Division, U.S. Steel Corp.
Electrical Contractors: Johnson Electric Co.; Hoffman & Elias, Inc.
Consulting Engineers: Hardesty & Hanover

Engineered Electrical Systems For Heavy Construction

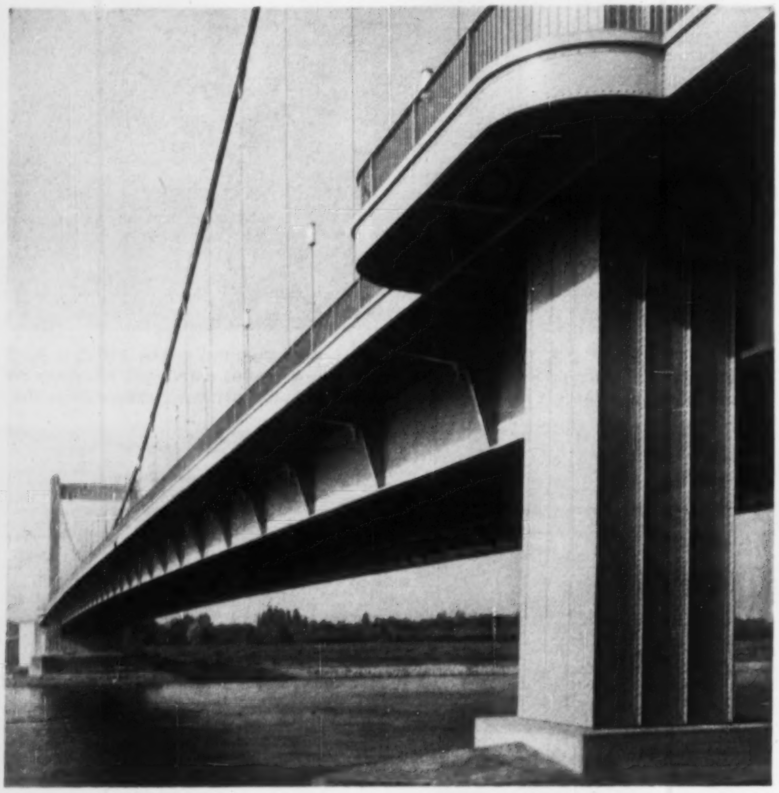
GENERAL ELECTRIC

New Ways to Cut Bridge Weight Lead to

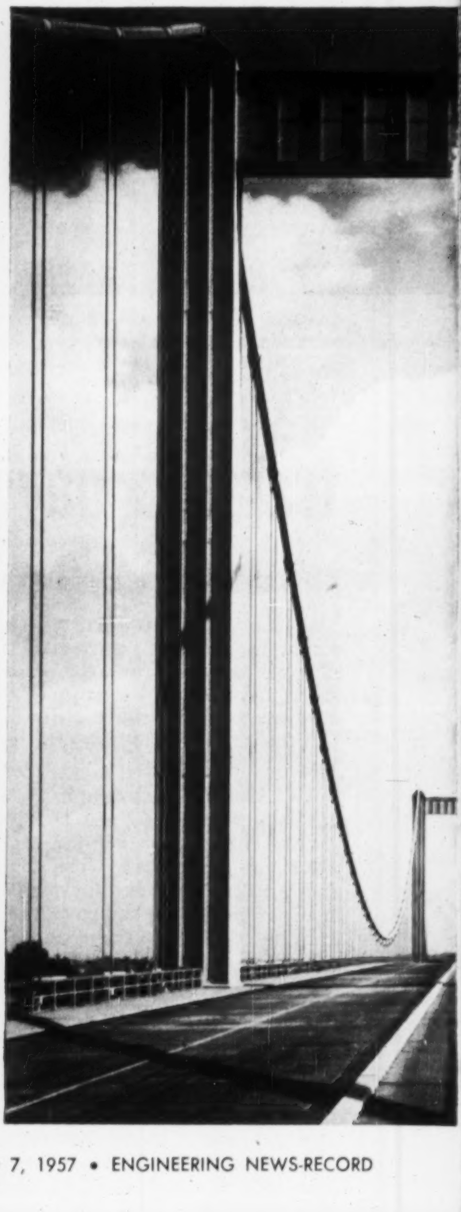
John G. Hotchkiss
Structural Engineer
New York, N. Y.

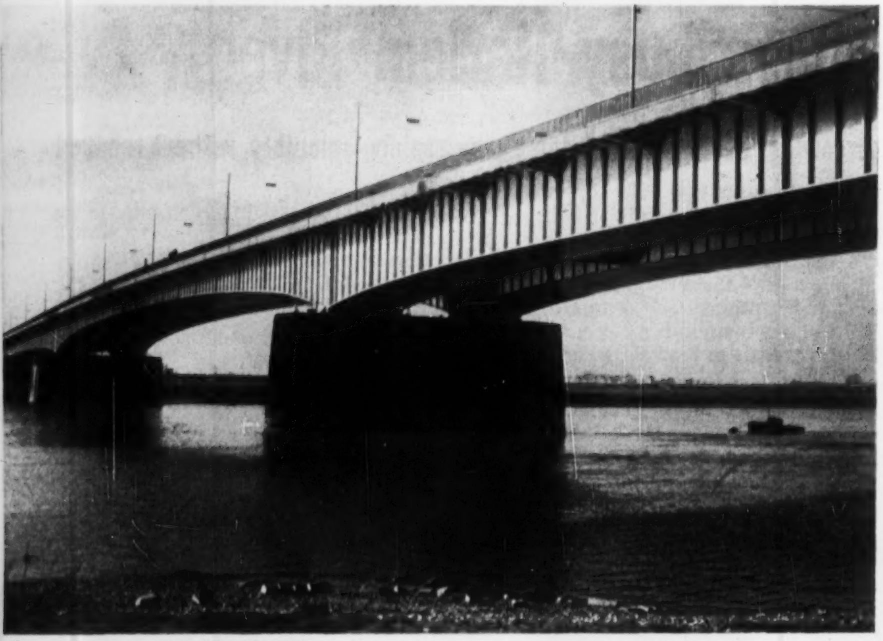
To accomplish the herculean reconstruction of war-destroyed bridges in the face of material shortages, German engineers after World War II sought lighter construction, requiring less structural steel. They were successful. They created new-type bridges, lighter in weight and more beautiful than their predecessors.

The Germans, however, did not have to start from scratch. They had previously set a trend toward weight reduction, beginning in the 1930's with the introduction of new higher-grade



SUSPENSION BRIDGE over the Rhine between Cologne and Muelheim, Germany, weighs 8,000 tons less than its predecessor which had the same spans.





BOX-GIRDER BRIDGE between Duesseldorf and Neuss weighs only 104 psf, though the center span is 675 ft and the side spans, 338 ft.

Record Spans

In Germany, more than 8,500 bridges were destroyed in World War II. With materials in short supply in the postwar era, German engineers, in rebuilding steel bridges, made them lighter and lighter. As new techniques were developed, longer spans became more economical. Thus, the stage was set for the record-breaking 856 ft span plate girder described in ENR August 8, page 46.

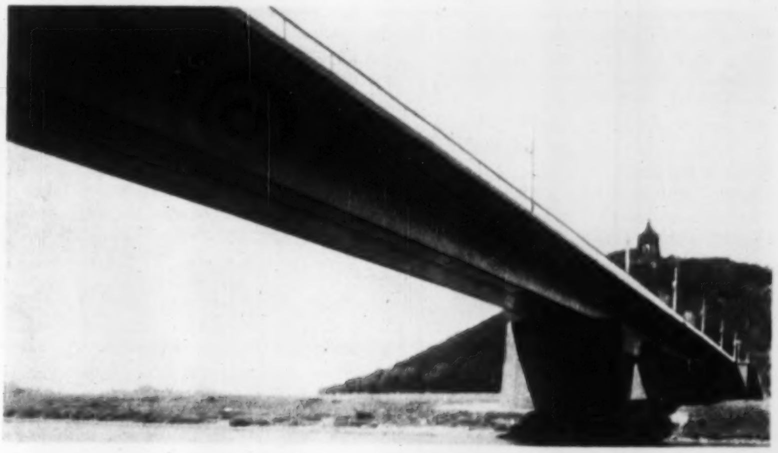
structural steels, improved designs and methods of arc welding. They took off from there to make further advances in bridge design.

A representative example of their success with weight saving is the Cologne-Muelheim Bridge. It replaced a suspension bridge that had been erected over the Rhine in 1928-29. The main span of the older structure weighed 14,400 tons. The main span of the new suspension bridge weighs only 6,370 tons, yet has a greater load-carrying capacity.

Though the distance between piers is the same for both structures, a weight saving of more than 50% was effected through the use of a light steel deck and an asphalt roadway placed directly on it.

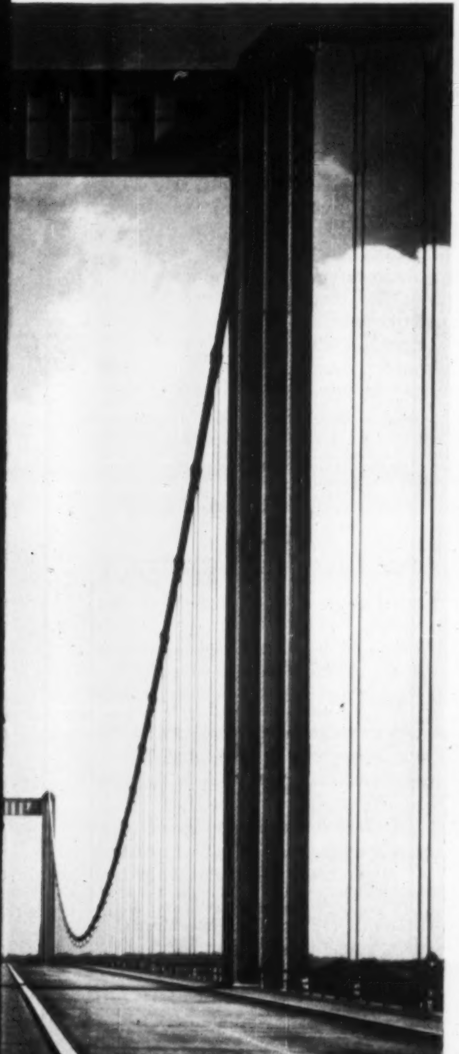
• **New deck-design theory**—Several factors were responsible for this great progress in bridge construction. Perhaps the most important was the development of a new type of deck.

Between World Wars I and II, superstructure design had undergone a radical change. In an initial, important forward step, bridge stringers and cross girders were rigidly connected to the main longitudinal girders, forming



▲

WELDED BOX GIRDERS made up of plates in the Weser Porta Bridge cut weight 25%.



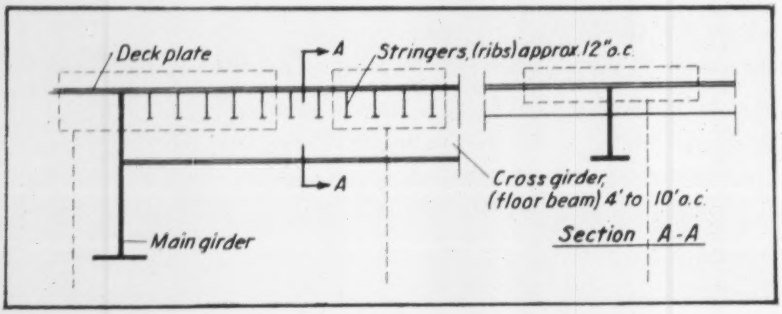
◀

REPLACEMENT of war-damaged Cologne-Rodenkirchen bridge weighs 3,080 tons less than the old one.

▶

COMPOSITE CONSTRUCTION of the Bonn-Beuel Bridge saved 25% of the weight of the bridge it replaced.

. . . New deck design reduces weight of German bridges


Deck plate
A
Stringers (ribs) approx. 12" o.c.
A
Cross girder, (floor beam) 4' to 10' o.c.
Main girder
Section A-A

LIGHT STEEL DECK, stiffened by closely spaced stringers and carrying only a thin asphalt pavement, is an important weight-saver in modern German bridges.

"traegerrost," which supported the concrete deck. (In 1929, the American Institute of Steel Construction introduced a similar construction, known as battledeck floor, which was described in ENR Aug. 29, 1929, vol. p. 326.)

In 1947, W. Cornelius introduced a deck-design theory for orthogonal-anisotropic plates (later called orthotrope plates). The name is derived from the behavior of the continuous deck plate over stringers, floorbeams and main girders.

Elastic behavior of this type of plate is determined by the variable stiffness of the supporting members, which are at 90 deg to each other. The plate serves three purposes: (1) as the top flange of main longitudinal plate girders, in conjunction with a portion of adjacent stringers; (2) as a load-carrying element between stringers, and (3) as the top flange of floorbeams.

Stringers and floorbeams are welded to the underside of the orthotrope plate. The stringers are made up of flat ribs, bulb flats or inverted tees, which stiffen the floorbeams, and in some bridges, pass through them.

The Germans also have used two other types of decks, known as "buckelbleche" and "tonnenbleche". Buckelbleche plates, used in railroad bridges before the war, are plates dished in two directions to retain the ballast. Tonnenbleche plates, on the other hand, are dished in only one direction (valley parallel to road). On highway bridges they support the concrete roadway. Designed for composite action, tonnenbleche plates act as the top flanges of the main girders and floorbeams.

• Advances in fabrication—These newer designs for steel decks, in turn, introduced special techniques in shop fabrication, methods of transportation and erection. Bridge decks, including large sections of stringers, floorbeams and girders now are fabricated as a single weldment. Special jigs capable of handling an entire width of bridge are used in fabrication shops. An advantage of this technique is a reduction in number of field connections.

It should be pointed out, however, that weight economy and decrease in on-site labor is partly offset by an increase in fabrication and welding in the shop. In Germany, and in Europe in general, first consideration is given to economizing material rather than labor. As an example, for a builtup, shop-welded, field-riveted, plate-girder bridge, continuous over five spans, with a 240 ft main span and deck designed by orthotrope theory, the cost of fabricated steel delivered to the site was $340 per ton. Skilled shop labor, in contrast, averaged only 43 to 53 cents an hour. Thus, the low labor cost justifies light steel construction.

• Composite construction—Advances in concrete construction also have provided greater opportunities for advantageously combining concrete and structural steel. Whereas steel decks normally are used for large spans, where weight reduction is especially important, composite steel-concrete construction is employed for medium and short spans. About 100 bridges have been constructed by this method. It has gained stature both for highway and railroad bridges.

• Asphalt pavement on steel—Another technique that has contributed to lighter weight structures is the placing of an asphalt pavement directly on the steel plate deck.

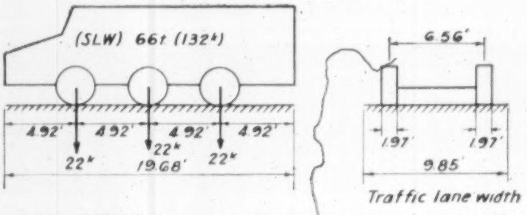
Occasionally, however, cracks developed in the bridge pavements of the Autobahn (Thruway) where asphalt had been cast on steel plates. The problem of preventing such cracking was referred to the asphalt industry.

Investigation showed that the cracking was not due to placing of asphalt on the steel plate, but to the actual composition of the asphalt. Cracking in every case was a result of the asphalt not being in conformance with federal specifications. Further investigation of nine pavements revealed no evidence of cracking.

Other bridge engineers became concerned with the problem. The large steel fabricator MAN (Maschinenfabrik Augsburg-Nuernberg), for example, carried out additional tests. The researchers concluded that resistance to asphalt cracking could be greatly improved by greater bracing of the deck plate. However, too great a stiffness, as in the older structures, can be a disadvantage, since the deck plates cannot flex, because of large negative moments, which places the deck under tension. Asphalt is susceptible to cracking under tension, especially at very low temperatures. As a result of what was learned from this research, no steel plate deck (orthotrope) designed by MAN has shown any evidence of asphalt cracking.

(*Continued on page 40*)

German Specifications for Live Load
Class 60 Live Loading



Regulation vehicle: SLW 60 (60 metric tons, 132 kips), 6 axles, wheel load—22 kips.
Traffic-lane width: 9.83 ft.
Vehicle length: 19.6 ft.
Load distribution: Area 9.83x19.6 ft, loaded with either (1) six 22 k concentrated wheel loads or (2) 683 psf uniformly distributed. Traffic lane in front and back of regulation vehicle loaded with 102.5 psf (1.01 k per lin ft of traffic lane). All other traffic lanes loaded with 61.5 psf (0.604 k per lin ft of traffic lane).
Impact: The live loads should be increased by a factor that depends on span. For a span of 13.1 ft, the live load should be multiplied by 1.50; for 32.8 ft, by 1.30; and for 328 ft or more, by 1.04.

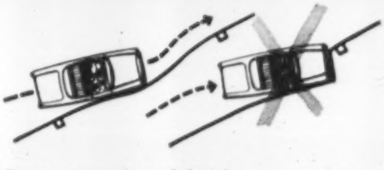
NEW
GRANCO
GUARD
RAIL!

AVAILABLE NOW! Granco Steel Products Company, leading building-products manufacturer in the Midwest, introduces new deep-beam Guard Rail for highways and bridges—available through distributors in principal cities.

HI-STRENGTH VISUAL BARRIER. Tough carbon steel. Corrugated shape. Acts as a continuous impact-resistant beam. Highways—12-gage; bridges—10-gage. Force of collision is absorbed by posts on *both* sides of the impact. Highly visible, reflects light day and night.

GREATER SAFETY. Granco Guard Rail reduces highway hazards, minimizes serious accidents and road "hogging," inspires driver confidence, channels out-of-control vehicles back onto road with least damage, lessens danger to other cars.

NO POCKETING! Guard Rail deflects cars *parallel* to roadway, can't trap them in a collapsing pocket (see drawing).



Beam strength and height prevent cars from hurtling over or going under rail. Flared end sections help prevent cars from hitting the end of a rail head on.

INTERCHANGEABLE SECTIONS. Standardized units have been adopted by American Association of State Highway Officials. Damaged sections do not impair efficiency of undamaged sections, may be rolled out and re-used.

ECONOMICAL. Sections nest conveniently for compact shipment, are easy to handle and install. Accessories are furnished with rail. Granco Guard Rail is painted with a rust-inhibitive primer, uniformly applied by "flow coating" and then baked to a hard-enamel finish.

IDEAL FOR BRIDGES. Granco Guard Rail provides a safe approach, permits maximum use of roadway, reduces center-line crowding, protects trusses.

NEW PRODUCT MANUAL! Contains eight pages of application photographs, standard drawings, specifications, curving data, installation instructions and facts on non-highway use. WRITE FOR YOUR FREE COPY TODAY. Attn.: Dept. E-714.

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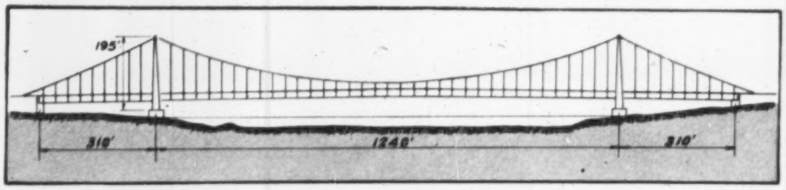
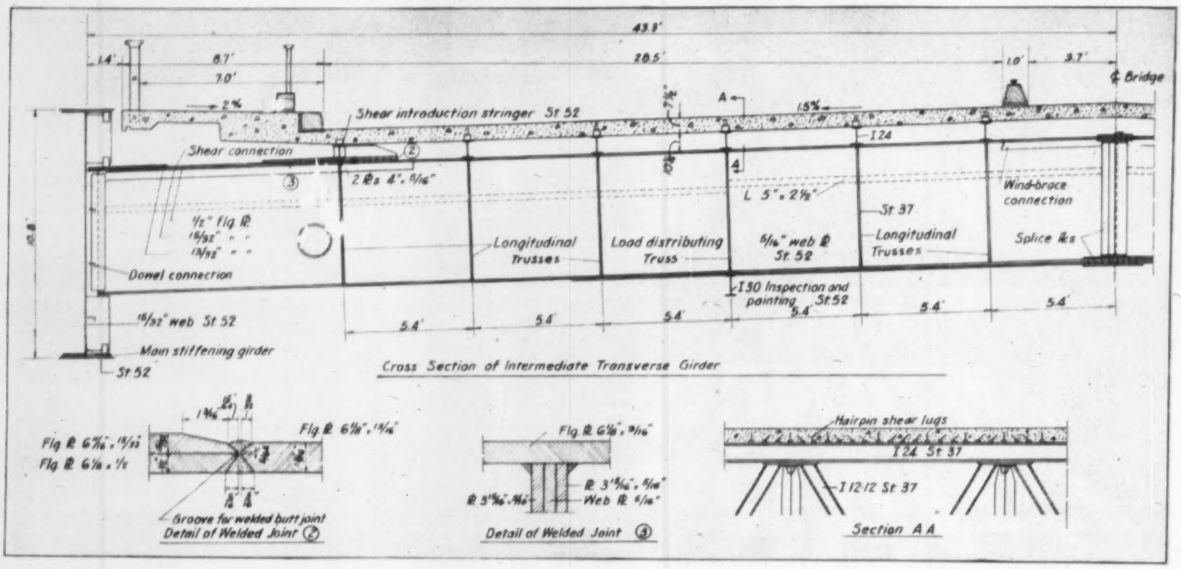
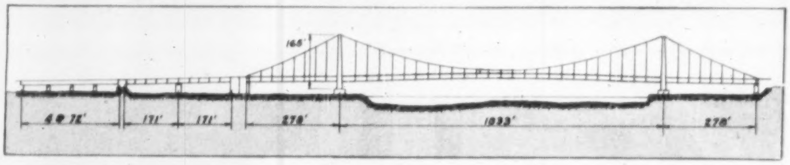
. . . Light steel bridges

COLOGNE-RODENKIRCHEN BRIDGE saves weight, through use of welded girders and composite construction of prestressed concrete deck and longitudinal steel stiffening trusses.

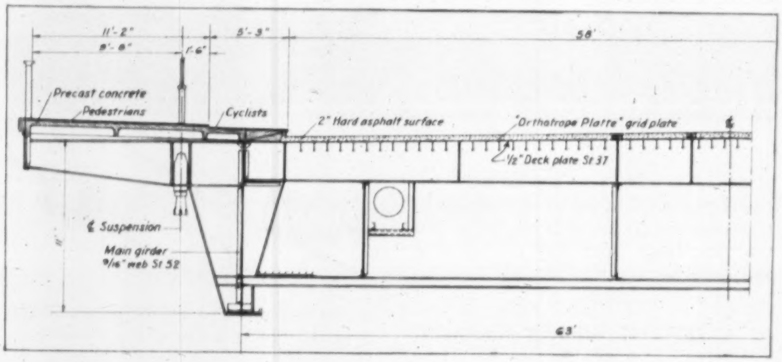

195'
310'
1240'
310'


43.3'
1.4'
8.7'
7.0'
28.5'
1.0'
3.7'
℄ Bridge
2%
1.5%
A
Shear introduction stringer St 52
Shear connection
②
③
2 ℞s 4" × 9/16"
I 24
L 5" × 2½
St 37
Wind-brace connection
½" flg ℞
15/32" " "
13/32" " "
10.8'
Longitudinal Trusses
Load distributing Truss
5/16" web ℞ St 52
Longitudinal Trusses
Splice ℞s
Dowel connection
I 30 Inspection and painting St 52
15/32" web St 52
Main stiffening girder
St 52
5.4'
5.4'
5.4'
5.4'
5.4'
5.4'
Cross Section of Intermediate Transverse Girder
Flg ℞ 6 7/16" × 15/32
Flg ℞ 6⅛ × ½
Flg ℞ 6⅛" × 13/16"
1 9/16
Groove for welded butt joint
Detail of Welded Joint ②
Flg ℞ 6⅛" × 9/16"
℞ 3 15/16" × 5/16"
℞ 3 15/16" × 5/16"
Web ℞ 5/16"
Detail of Welded Joint ③
Hairpin shear lugs
I 24 St 37
I 12/12 St 37
Section A A

COLOGNE-MUELHEIM BRIDGE is stiffened by continuous riveted plate girders.


165'
4 @ 72'
171'
171'
278'
1033'
278'

ORTHOTROPE PLATE, of ½ in. thick steel, not only supports the pavement but also serves as the top flange of the girders. Pavement is 2 in. of asphalt.


11'-2"
9'-8"
1'-6"
5'-3"
58'
Precast concrete
Pedestrians
Cyclists
2" Hard asphalt surface
"Orthotrope Platte" grid plate
℄
½" Deck plate St 37
℄ Suspension
Main girder 9/16" web St 52
63'

The Public Works Department of the City of Cologne also conducted tests of tensile stresses in asphalt developed during the bending of a steel plate under low temperature. Its conclusion was: If steel plate decks are made stiff enough and the composition of the asphalt permits it to withstand temperatures of − 22 F to + 140 F, cracking can be avoided.

Present German recommendations specify that the total deck thickness should be about 2 in. (50mm) and made up as follows:

Steel deck plate . . . variable thickness
Corrosion protection (lacquer, hot bitumen or combination) $\frac{3}{64}$ in.
Mastic binder . . . . $\frac{5}{64}$ in.
Layer of building paper
First layer of cast asphalt (no binder) . . . . $\frac{3}{4}$ in.
Second layer of hard cast asphalt (5% to 6% pure rubber in liquid or powder form) . . . . . . $\frac{7}{8}$ in.

Expansion joints are also specified 17.4 ft on centers (perpendicular to the roadway, unless trolley tracks are present). Joints must pass through both layers of asphalt. Such a specification requires a 10 year guarantee.

Another factor contributing to lighter construction in bridge design was a solution of buckling and torsional-stability problems. Considerable research was devoted to these problems by the Germans.

The two most important developments in postwar bridge design resulting from these studies were:

1. Steel decks of cellular, or other torsionally stiff assemblies.

2. Composite construction, with or without prestressed concrete slabs.

• **Steel specifications**—German low-car-

Aerial views of Houston freeway

FOR FREEWAYS

Concrete Gives

Lower Annual Cost and Longer Life

Enormous increases in highway traffic by passenger cars and heavily loaded trucks have made the patterned mazes of today's freeways a transportation necessity.

America's most modern freeways use concrete—the road material which provides smooth uninterrupted travel regardless of the loads to be carried or the weather, at a lower annual cost. Here again, concrete serves the rapidly expanding needs of the nation with a construction material whose flexibility of use and durability have made it a "must" for good freeway construction.

Ideal Cement Company, Growing with the Country

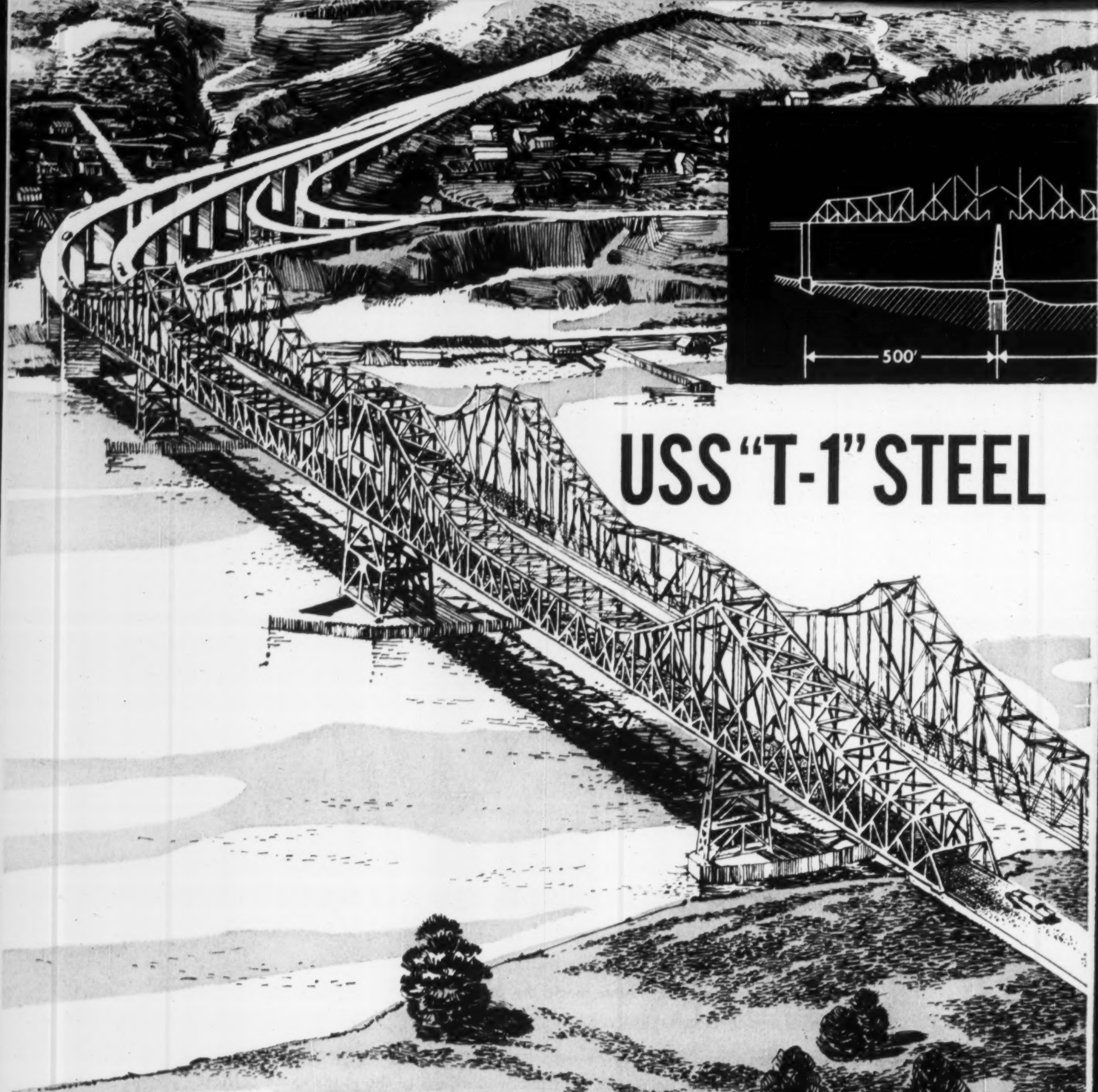
PORTLAND IDEAL CEMENT

IDEAL CEMENT COMPANY

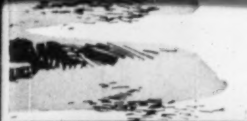
DENVER, COLORADO

14 Plants and 3 Terminals Serving
Some of the Most Rapidly Growing Areas of the Nation

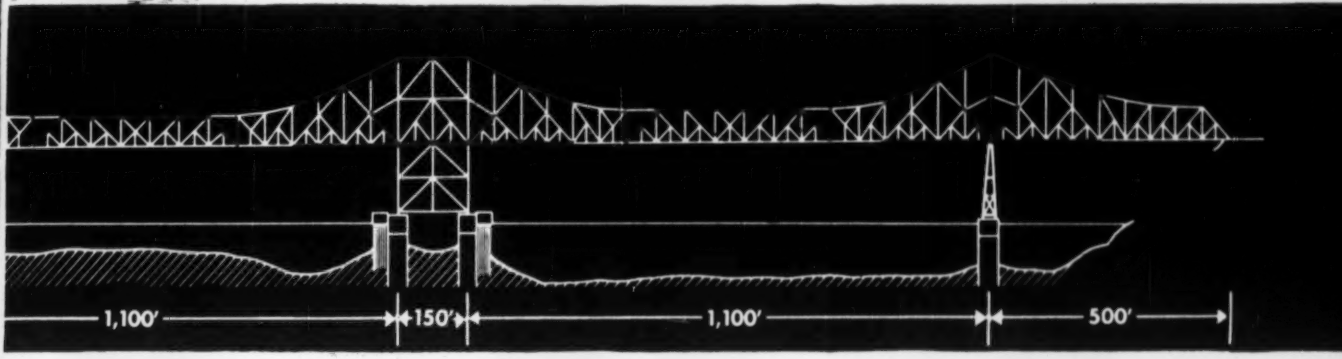
USS "T-1" STEEL



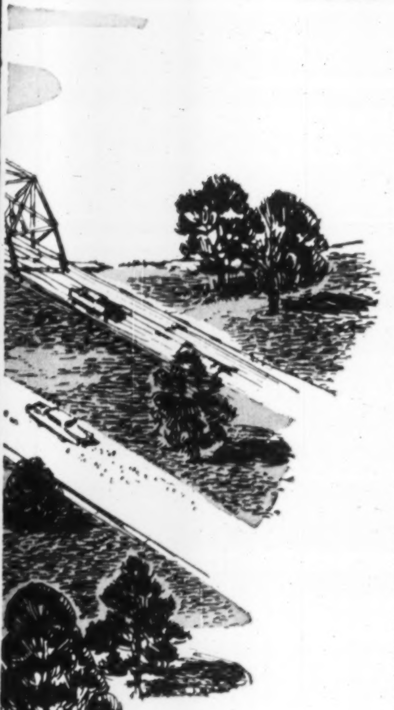
LOOKING SOUTH over the Carquinez Straits Bridges. New span, on the left, is 60 feet wide—18 feet wider than the original bridge built 30 years ago. New span will carry four lanes of one-way traffic.



NEARLY 500 of the more than 1,000 gusset plates and 142 of the 664 truss members in the new bridge were made from USS "T-1" Steel. The weldability and very high strength of this remarkable alloy steel saved weight, time and money.



WILL SAVE $800,000 IN FIRST MAJOR BRIDGE APPLICATION



Next year the State of California will open a new toll bridge paralleling an existing structure across the Carquinez Straits. This will be the final step in a mammoth project underway to relocate some twelve and a half miles of very busy highway connecting the San Francisco Bay Area with the Sacramento Valley.

The new $20-million bridge will be unusual. While, in appearance, it is a near carbon copy of the present structure across the busy straits, it will employ some 2,900 tons of USS "T-1" Steel in its most highly stressed truss members. Of 664 members in the trusses, some 142 will be of welded construction and made of "T-1" Steel.

The weldability and 90,000 psi minimum yield strength of USS "T-1" Steel will dramatically simplify design and fabrication of critical members. Take one example, a lower chord member: In the new structure, it will be made from just five welded plates of "T-1" Steel and require 340 feet of 5/16" automatic fillet welds. But, had it been put together by stitch riveting, the method used in the original span, this same chord member would have required *eight* vertical plates, *four* angles, and *two* cover plates . . . plus *1,000* rivets and *3,600 punched and reamed holes!*

Besides ease of fabrication gained through welding, "T-1" Steel's tremendous strength permits big weight savings. For example: one of the top chord members of the new bridge will weigh 400 lbs. per ft. and have a section area of 117.19 sq. in. A structural carbon steel (ASTM A-7) member for the same location would weigh 996 lbs. per ft. and would require a section of 293 sq. in. Lighter, smaller members mean reduced moment of inertia and important reductions of secondary stresses.

According to design computations by the State of California, USS "T-1" Steel will save approximately $800,000 in building the new Carquinez Straits Bridge—the first major bridge application of this remarkable constructional alloy steel.

For More Information—Write on your company letterhead for our newly revised, comprehensive booklet entitled "T-1." You'll find in it a wealth of engineering and metallurgical data. Or, contact our nearest representative—you'll find him listed in the telephone directory under UNITED STATES STEEL.

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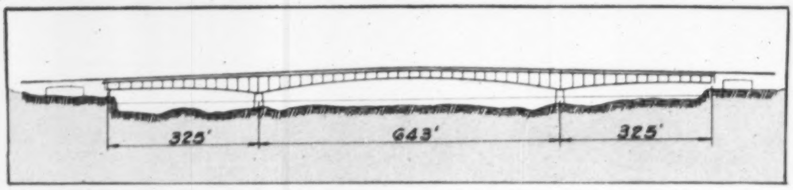
USS

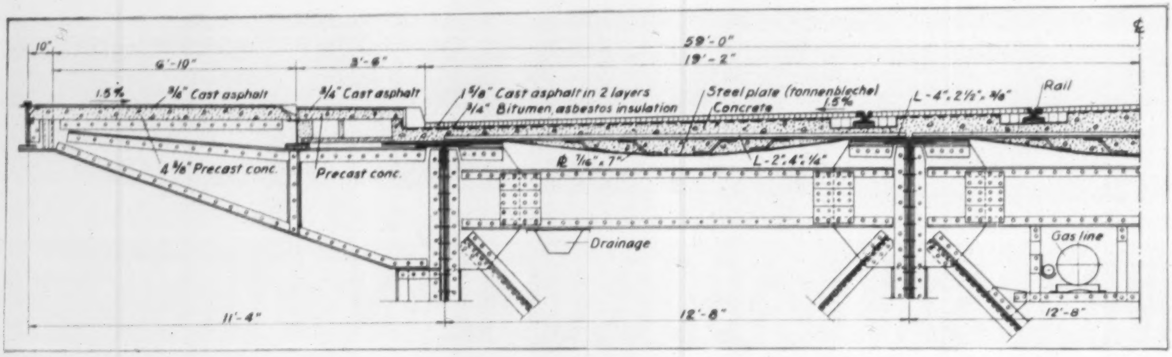
Watch the **United States Steel Hour** on TV every other Wednesday (10 p.m. Eastern time).

UNITED STATES STEEL

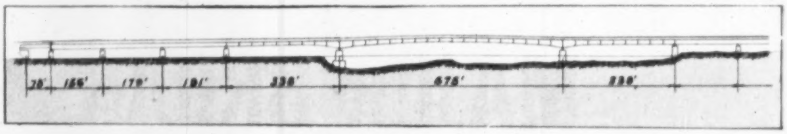
. . . New-type bridge decks

BONN-BEUEL BRIDGE has four plate girders that carry a tonnenbleche deck. The concrete roadway is supported by the dished steel plate, which also serves as the top flange of the girders.

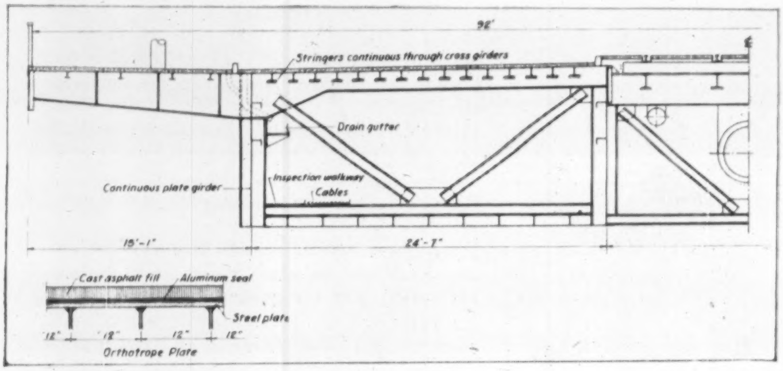



10"
59'-0"
6'-10"
3'-6"
19'-2"
1.5%
3/4" Cast asphalt
3/4" Cast asphalt
1 5/8" Cast asphalt in 2 layers
3/4" Bitumen, asbestos insulation
Steel plate (tonnenblechel)
Concrete
1.5%
L-4".2½".⅜"
Rail
4 ⅜" Precast conc.
Precast conc.
℞ 7/16" x 7"
L-2".4".¼"
Drainage
Gas line
11'-4"
12'-8"
12'-8"

DUESSELDORF-NEUSS BRIDGE, composed of two steel box girders, is unusually shallow for its 675 ft span.


78'
156'
179'
191'
338'
675'
338'

LIGHTWEIGHT DECK consists of 1¼ in. of asphalt laid on a steel grating welded to the top of an orthotrope plate.


92'
Stringers continuous through cross girders
Drain gutter
Inspection walkway
Cables
Continuous plate girder
15'-1"
24'-7"
Cast asphalt fill
Aluminum seal
Steel plate
12"
12"
12"
12"
Orthotrope Plate

bon structural steel used in the new bridges is comparable to ASTM A7 steel and is known as St.37 or St.37.12. It has an ultimate tensile strength of 52,500 to 64,000 psi. The minimum yield point is 33,300 psi.

Before the last war, a high-tensile alloy steel St.52 was developed. It is still used, particularly for welding. Its ultimate strength is 78,300 to 92,500 psi.

Other special steels (designated m.e.S.) with welding qualities and high yield points have been introduced recently. The Duesseldorf-Neuss Bridge was built with such a steel—St.50 m.e.S. Another such type of steel HSB 50, used in the Weser Porta Bridge, has an ultimate strength of 71,000 to 85,200 psi and a yield point of 51,300 psi. It contains 0.20% carbon, 0.45% silicon, 1.10% manganese.

• Designers build the bridges—In Germany, it is customary, due to money shortage and the limited number of large bridge projects, to award a bridge contract to a joint venture of several fabricators. Distinctly different from American practice, the fabricator also acts as designer, erector and general contractor. Selected on the basis of bids on competitive designs, the successful firm acts as the prime contractor for the project.

Following are descriptions of several bridges illustrative of the weight-saving techniques used by German engineers.

• Cologne-Rodenkirchen Bridge—This suspension bridge was built in 1954. It has spans of 310–1240–310 ft. Over a width of 86.5 ft, it carries four lanes of traffic for the Autobahn and a 7 ft sidewalk on each side.

The bridge has two main longitudinal plate girders, which support builtup floorbeams, and two longitudinal, load-distributing trusses, located at the third points of the floorbeams. Intermediate longitudinal trusses, and stringers on the top flanges of the floorbeams, are spaced 5.4 ft apart.

A prestressed concrete deck, 7¼ in. thick, works with the longitudinal and stiffening trusses and the floorbeams, through the stringers, in resisting flexural stresses. The superstructure was shop-welded and field-riveted.

Modern design methods were responsible for a considerable weight reduction—3,080 tons—compared with the suspension bridge replaced, in spite of increased live loads. The reasons for this decrease were:

1. Instead of riveted main girders as formerly used, welded built-up plate girders were provided.
2. The reinforced concrete roadway slab is continuous over the entire length of bridge without a joint. This slab was designed to sustain part of the load carried by the main supporting system; composite action was assured by an elastic shear connection with the

"I tune up my GMC Diesels twice a year —then forget them"

—says Paul Wagner, Jr., of Lexington Sand & Gravel, South Acton, Mass., in reporting on his giant dumps

PAUL WAGNER doesn't believe in pampering trucks. His have to haul at least five 40-mile round trips a day. And they have to do that *every* day.

King-size Loads

Lexington's trucks haul *real* payloads, too. The GMC DW974 in the picture totes 19 tons. His GMC D662 semitrailer dump handles 20. And even when a job takes them over the best roads around, they still have the stop-and-go penalties of heavy daytime traffic.

5 Miles a Gallon

Despite their heavy-hauling assignments, Wagner's GMC Diesels are averaging better than 5 mpg. That's 50% better than gasoline trucks doing the same job, he reports.

No Overhauls in 125,000 Miles

Most important of all, these GMC's seem to require amazingly little servicing. One Diesel has already clocked 125,000 miles. It's never been overhauled—there's no need in sight. Yet Wagner's other-make trucks had to be rebuilt at 100,000 miles.

Next Truck a GMC, Too

"Since my first GMC in '54, I haven't bought anything else," Wagner says. "If I needed another truck right now, I think it would be another GMC. They give me just what I want in a truck. And I've never seen another firm so ready to stand behind their product after you've bought one."

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EVEN WITH A 19-TON LOAD ON ITS BACK, this GMC DW974 Diesel takes on tough pulls like this without sweat or strain. Its big, *2-cycle* Diesel delivers top torque—all the load-moving power it takes to handle the most punishing hauling conditions on or off the highway.

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In multi-story construction, need for drop slab construction is eliminated.

Thin Terrazzo made with Surco, the oldest latex binder on the market, offers some very practical advantages to builders, too. Because it's so thin, you can save up to 15 pounds per square foot weight, and cut down a couple of inches vertical measurement on each floor. No metal dividers are needed unless desired, and Surco Thin Terrazzo is awfully easy and inexpensive to maintain.

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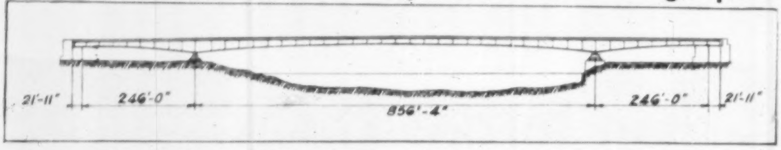
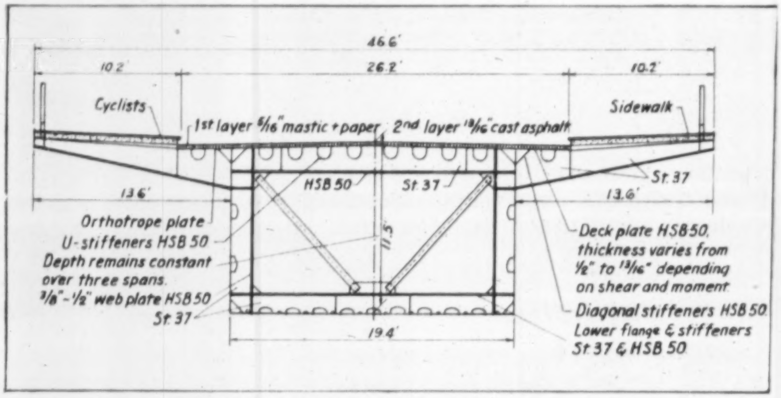


SAVE RIVER BRIDGE, Belgrade, Yugoslavia, holds the world's record for plate-girder spans. It has a light, orthotrope steel deck, paved with asphalt.


46.6'
10.2'
26.2'
10.2'
Cyclists
1st layer 5/16" mastic + paper
2nd layer 13/16" cast asphalt
Sidewalk
HSB 50
St 37
St 37
13.6'
13.6'
Orthotrope plate
U-stiffeners HSB 50
Depth remains constant over three spans.
3/8"-1/2" web plate HSB 50
St 37
11.5'
19.4'
Deck plate HSB50, thickness varies from 1/2" to 13/16" depending on shear and moment
Diagonal stiffeners HSB 50
Lower flange & stiffeners St 37 & HSB 50

WESA PORTA BRIDGE, a welded continuous steel box girder with spans of 209-256-349 ft, has a variation of the orthotrope plate deck with U-shaped and diagonal stiffeners.

top chords of the stiffening trusses.

3. Orthotrope deck design incorporated composite construction with the concrete slab.

4. Prestressing of the concrete slab was done by tensioning cables in both the longitudinal and transverse directions. Additional mechanical prestressing was obtained by inducing tensile stresses in the stringers before concreting the slab. Also, tensile stresses were induced in the stiffening trusses after concrete set, thereby reducing shrinkage and creep stresses in the concrete.

5. The stiffening trusses were initially deformed in the shop and erected in the field by riveting to produce a definite stress condition. Statically indeterminate reactions in the stiffening girders made possible balancing of maximum and minimum live-load moments.

It should be noted that erection of the stiffening trusses with riveted joints made it feasible to construct the concrete deck without any joints. Deformations developed after placement of the concrete were considerably less than with deliberately-made open joints that would have to be closed after the concrete set.

The Cologne-Rodenkirchen Bridge cost 17.2 million DM ($4.1 million). In the superstructure, 57% of the steel was St.52, of which 66% was welded—485,000 ft of weld was laid in the shop and 41,000 ft in the field.

August Kloenne of Dortmund headed up the joint venture.

• Cologne (Koeln)-Muelheim Bridge—This suspension bridge, constructed in 1951, has spans of 278–1,033–278 ft. Its total width of 91 ft includes 58 ft of traffic lanes, two tramway tracks, a 5.25 ft cycle lane and 11.2 ft sidewalks on each side.

The cross-sectional framework is shaped like a channel with web horizontal and is continuous for the entire bridge length. Main longitudinal members are 11 ft high, riveted plate girders with a 9/16 in. web plate. These continuous girders have a very small depth-span ratio—1/62.5 at midspan and 1/26.5 at piers.

Deck design is the orthotrope plate type, with a ½ in. steel plate welded to 6 in. bulb stiffeners spaced 10 in. apart. The pavement consists of 2 in. of asphalt.

The steel deck is welded to the webs of the longitudinal girders, and with the longitudinal ribs, it acts as the top flange of these girders.

The weight of the welded deck assembly is 29.8 psf. A total weight of 6,370 tons, which is more than 50% less than that of the old bridge, was accomplished by:

1. Use of St.52 high-strength, low alloy steel.
2. Application of welding.
3. Development of a light deck system to act as part of the main girders. The 6,370 tons consisted of 60% St.52 steel, of which 65% was welded.

The Gustavsburg plant of MAN executed this project.

• Bonn-Beuel Bridge—This highway bridge consists of four continuous plate

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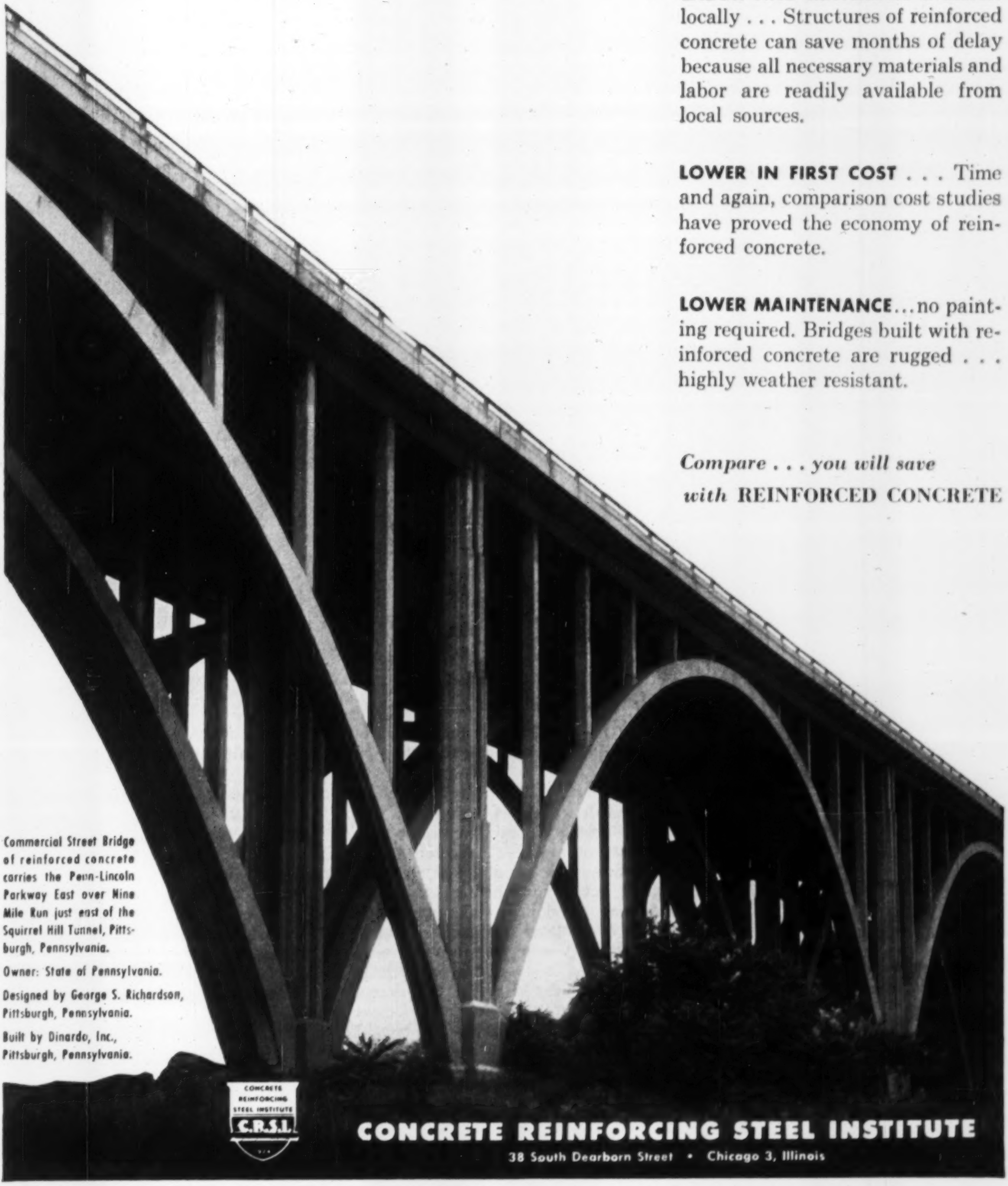

Commercial Street Bridge of reinforced concrete carries the Penn-Lincoln Parkway East over Nine Mile Run just east of the Squirrel Hill Tunnel, Pittsburgh, Pennsylvania.

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Designed by George S. Richardson, Pittsburgh, Pennsylvania.

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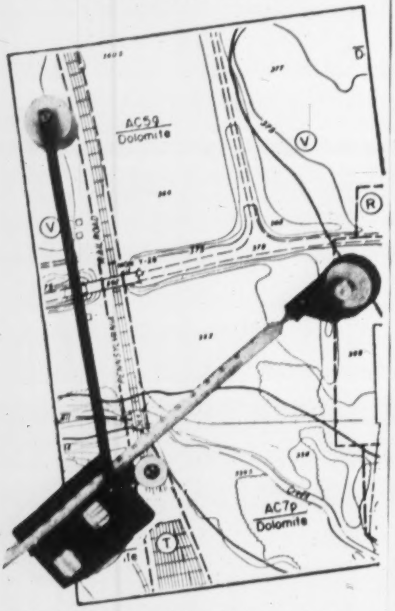

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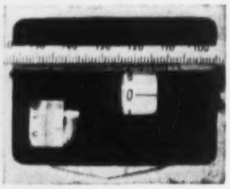

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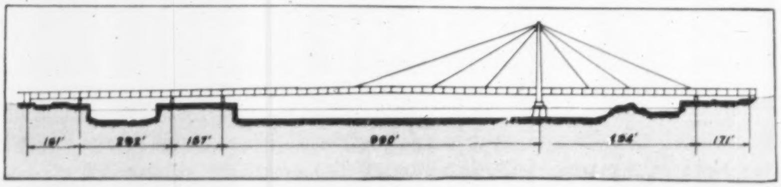

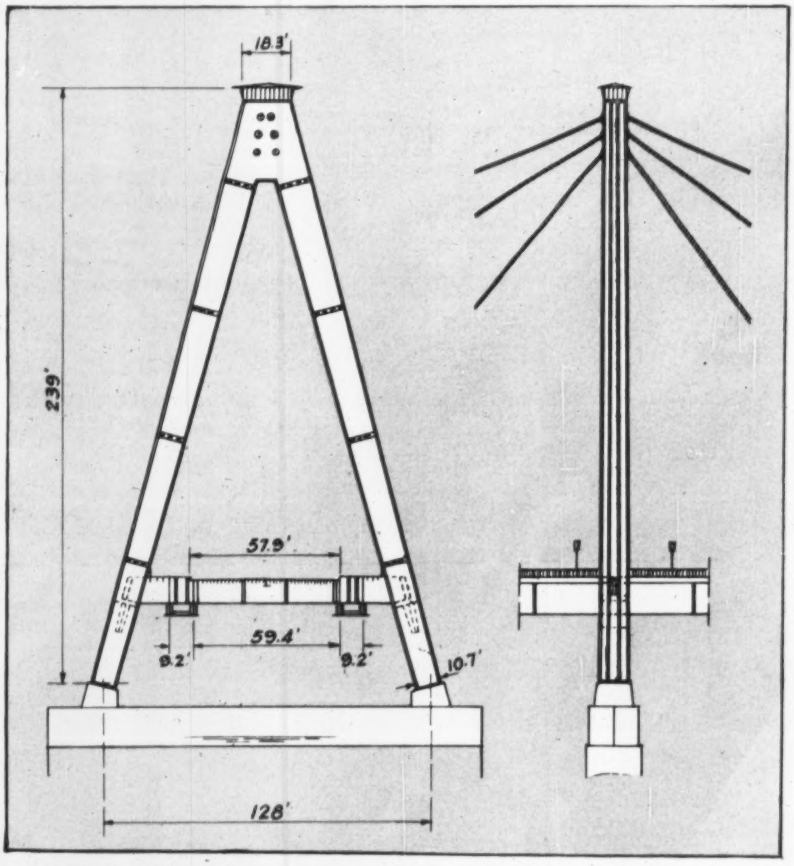

COLOGNE HIGHWAY CROSSING will be a cable-braced, continuous plate-girder bridge, with cables extending from only one tower, an A-shaped pylon.

girders spanning 325–643–325 ft. The width of deck is 59 ft. It provides two lanes of traffic and two tramway tracks, also the customary cycle and foot paths.

At the time it was designed, in 1949, asphalt pavements on steel plate had not been developed. Instead, a reinforced concrete slab was placed on a steel plate spanning between the girders, forming a tonnenbleche deck. When bids were received, this design proved to be not only the lowest weight but also the lowest cost. The weight difference, compared with the bridge it replaced, was 20%.

The new bridge has a concrete deck supported on the steel plate, which is dished in the longitudinal direction and serves as the top flange for the four principal girders. This type of construction has a great influence on the efficiency of the framework.

In the design, consideration had to be given to the steep gradient of the roadway, which was required to provide clearance for ships.

The depth-span ratio at midspan is 1/65, and at the piers, 1/18.6. Weight is 132 psf.

Friedrich Krupp Maschinen and Stahlbau Rheinhausen of Rheinhausen headed up this project.

• **Duesseldorf - Neuss Bridge** — Constructed in 1951, this structure consists of two steel box-girders heavily braced transversely with diagonals in the center and end spans. The girders are continuous over spans of 338–675–338 ft. The roadway is 1¼ in. thick

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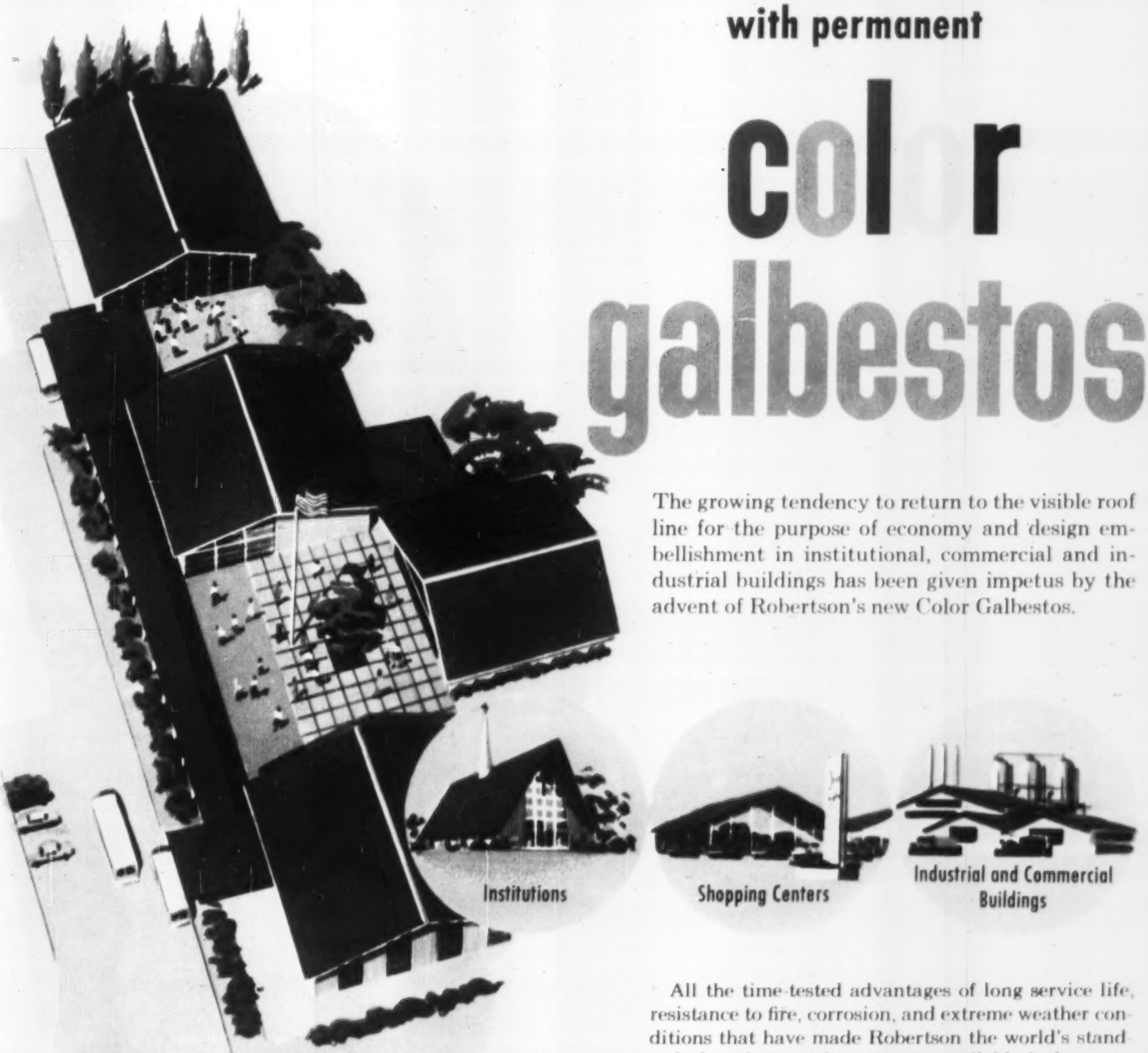
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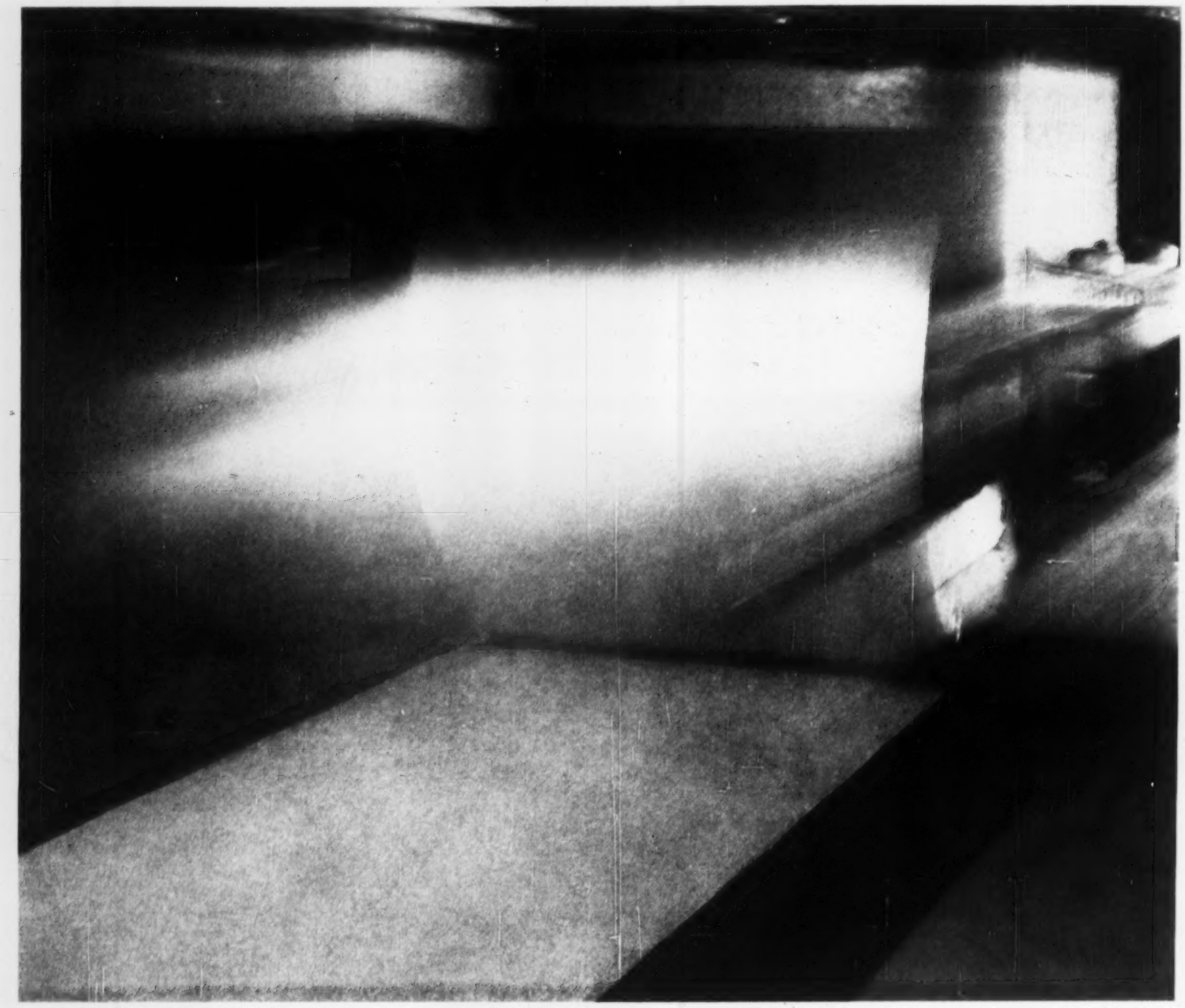

Torture test proves Armstrong Temlok Roof Insulation will protect your job specifications

IN one of the most grueling tests ever given a roof insulation material, Armstrong Temlok Roof Insulation showed tremendous resistance to heavy traffic loads.

The test was conducted at the Armstrong Research and Development Center, Lancaster, Pennsylvania. Two pieces of Armstrong Temlok Roof Insulation, each 6″ x 12″, were used to make the test. A metal roller, carrying a 185-pound weight, was passed back and forth over the roof insulation at the rate of 12 strokes per minute. Shear failure of the insulation did not occur until more than 400 passes had been made. Resilient types of roof insulation tested failed after only 4 passes of the roller.

This grueling test explains why many leading architects and engineers specify Armstrong Temlok Roof Insulation for strength as well as insulation efficiency.

Temlok Roof Insulation is a sturdy fiberboard material that provides a firm base for felt courses. Installation crews can push wheelbarrows on it, rest mopping buckets, or use mechanical equipment without denting the surface.

Even under moderate roof traffic conditions, resilient types of roof insulation "give" enough so that even heel impact may puncture the felt and lead to eventual roof leakage. This is especially true on fluted metal decks where softer types of materials are easily dented along the valleys of the deck.

Roof damage usually entails expensive repairs and considerable inconvenience to everyone concerned. And such failures reflect on the judgment of the specifier. Protect your job specification with Armstrong Temlok Roof Insulation.

For complete information on Armstrong Temlok Roof Insulation, write to Armstrong Cork Company, 3811 Wallace St., Lancaster, Pennsylvania.

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. . . Advances in bridge design point to longer spans

MAN
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MAN
MAN

LONG SECTION of a bridge superstructure is prefabricated and erected by a German firm as a single unit. Light weight designs make this feasible.

asphalt and was laid on a steel grating welded to the top of an orthotrope plate. (In 1951, the designers believed it was necessary to provide a mechanical means of preventing the asphalt from slipping; hence, a zig-zag grating was used. Today, such mechanical bonding is considered unnecessary.)

The depth-span ratio at midspan is 1/62.5 and over the piers 1/26.5. Weight of the superstructure is 11,650 tons, averaging 104 psf.

Hein, Lehmann & Co. AG of Duesseldorf was prime contractor on this project.

• Weser Porta Bridge—Opened to traffic in 1954, this bridge was selected for illustration because it is a good example of all-welded, integrated framing. Its total width of 46.6 ft is made up of two 26.2 ft. traffic lanes and a sidewalk and cycle path both 10.2 ft wide, on each side.

This bridge is a continuous steel box-girder, with spans of 209–256–349 ft. The box girder has a constant depth of 11.5 ft for the three unequal spans.

The thickness and quality of steel in the deck plate vary throughout the length with the moment and shear. U-shaped stiffeners and diagonal stiffening plates are characteristic of this design, which is a variation of the orthotrope plate type. The thin ($\frac{5}{16}$ in.) plate U-stiffeners are fillet-welded on the exterior sides at the junction with the deck plate.

The bridge has no rolled sections; plate construction was used throughout, thus saving 25% in weight. Money saving was reduced somewhat, however, because of increased fabrication and welding costs. Savings also resulted from use of a welded box-section, the designer reports, because this section reduced to a minimum painting and rusting, since there were no cover plates, rivet heads and re-entrant angles.

The superstructure is about 70% high-strength, HSB 50 steel and 30% St.37.

Cost was about 1.5 million DM ($357,000) for the structural steel only. Johannes Doernen, Stahlbauwerk and C. H. Jucho supplied the steelwork.

• Cologne Highway Bridge—This continuous plate-girder bridge, to be built over the Rhine, will have a cable-braced center span of 990 ft and a cable-braced end span of 494 ft. Since this bridge is still in the planning and design stage, and since the City of Cologne reserves the right to first publication of details, only general comments follow. Erection is scheduled to start in the spring of 1958, and presumably the bridge will be completed by the summer of 1959.

Interestingly, this bridge will have only one pylon—on the east side of the Rhine. [The author was informed, while in Cologne, that local townspeople revere their famous Gothic cathedral (Dom) so much that it was required that all river passengers must have an unobstructed view of the beautiful Dom.]

The bridge will be chiefly of welded construction. Field joints of the main girders will be riveted, while the deck plate (believed to be orthotrope design) will be field welded. The weight will average 84 psf.

The superstructure is estimated to cost about 16 million DM ($3.8 million). Design of the bridge will incorporate the latest techniques, with principal consideration given to reduction in steel weight.

Gutehoffnungshuette Sterkrade AG Oberhausen-Sterkrade will head up this project.

• Save River Bridge—Constructed at Belgrade, Yugoslavia, to replace a suspension bridge destroyed during the last war, this new highway bridge is the largest continuous plate-girder bridge in the world (ENR Aug. 8, p. 46). It has a central span of 856.3 ft and two end spans of 246 ft.

Through the use of a steel orthotrope plate deck an appreciable saving in weight was achieved. Although identical spans were used for both the old and new bridge, the plate-girder design weighed 3,000 tons less, in spite of increased live loads. The lightweight superstructure weighs 3,800 tons, averaging 104 psf.

MAN prepared the design and was entrusted with the execution of the erection and preparation of working drawings. This firm also supplied 1,400 tons of steel deck.

The Save River bridge now holds the world's record as the longest plate-girder bridge. But with steady improvements in steel design this record may not stand for long.

The author is especially grateful to Walter Wolf, director, and P. Boue of the Deutscher Stahlbau-Verband of Cologne, for their able assistance and loan of photographic material.

Permissible Unit Stresses for Highway Bridges (Kips per sq in.)

		St.37.12 Carbon Steel		St.52 High Tensile Steel	
Types of Stress	Loading	Structural members except connections	Connections* but not fasteners	Structural members except connections	Connections* but not fasteners
Tension	H	19.9	17.1	29.1	25.6
Tension	HZ	22.8	17.1	34.1	25.6
Shear	H	11.95	10.25	17.9	15.4
Shear	HZ	13.65	10.25	20.5	15.4
Compression	H	Same as tension			
Compression	HZ	Same as tension			

H = Sum of permanent loads; viz., live loads (snow without wind), impact

HZ = Sum of H-loadings plus Z-loadings

Z = loadings due to wind, braking forces, horizontal crane forces, crane loads, crane loads during erection.

*Stresses for rivets, bolts and welding are not included here under the heading, connections.

ANOTHER SOCONY MOBIL FIRST FOR CONTRACTORS

NEW PRACTICAL PM SYSTEM

Helps prevent equipment troubles— cut delays!

Socony Mobil's new, simplified PM system for contractors is especially designed to help keep equipment in top working order with a minimum of paper work. This practical program can help prevent breakdowns—caused by lack of lubrication care—that cost time and money. It's an important part of Socony Mobil's Correct Lubrication Program which also includes:

Famous Quality Products such as Delvac Oils, New Mobilube GX Multipurpose-type Gear Lubricant, Mobilgrease.

Lubrication Engineering Service covering analysis, advice and use of Socony Mobil's outstanding technical know-how.

Ask your Socony Mobil representative to show you how this ingenious new system can help you.

Contractor PM System Includes:

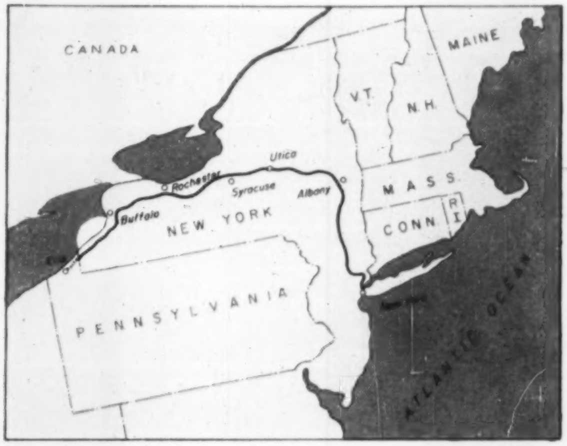
1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
2. Operator's Recommendation Chart—lists the correct lubrication recommendations for each piece of equipment.
3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

SOCONY MOBIL Mobil *Correct Lubrication*

Leader in lubrication for over 91 years

A PROVED PROGRAM TO REDUCE EQUIPMENT MAINTENANCE COSTS

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION



The Erie section of the New York State Thruway—(above)—last link in the limited access route to the west, will be completely open to traffic in early December. Clay (right), strikes, and bad weather have delayed completion.

Erie Thruway to Open—Ten Months Late

The white man is still trying to get land from the Indians—and that is just one of the reasons why the Erie section of the New York Thruway is nearing completion as much as ten months behind schedule. Steel shortages, cement strikes, last year's rains, this year's drought and blue clay that can't be scraped out of a bucket have all contributed to slow up construction of the final stretch of the limited access road which will connect New York and New England with the Midwest.

The Erie Thruway is a 70 mile, $85 million, four-lane concrete road which will run from Buffalo to the Pennsylvania line near Erie. Except for a 43 mile soon-to-be-constructed road across northern Pennsylvania and a 60 mile stretch from Conneaut, Ohio to the Warren Interchange on the Ohio pike, completion of the Erie Thruway will permit non-stop travel between Chicago and either Boston or New York City. One of the few tollroads still being built, the Erie thruway skirts the south shore of Lake Erie parallel to and, for about half its length, between N. Y. Rt. 5 and U. S. Rt. 20. For construction purposes the road was divided into 18 contracts let to eight contractors.

The 41 miles from Silver Creek to the Pennsylvania line were opened last August, and the remaining 29 miles, if the present schedule is followed, will be carrying traffic this December.

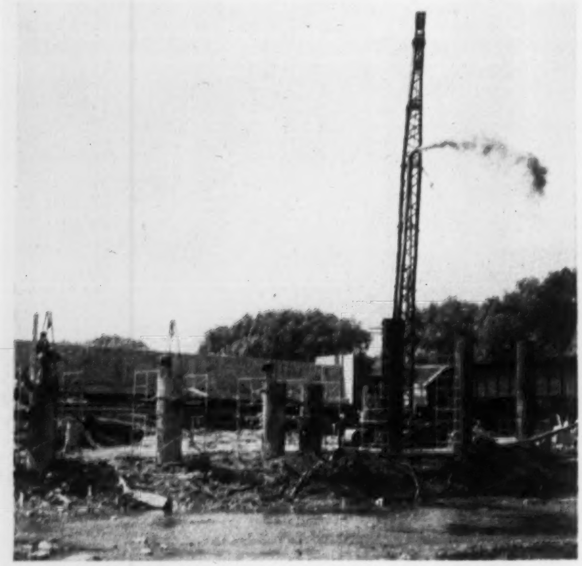
The Indians—and it's the squaws not the braves that are swinging the tomahawks—have posed a special problem for several of the contractors. The road goes through the Cattaraugus Indian Reservation in Chautauqua and Erie Counties. Under Federal treaties, individual tribe members own their land only to plow depth—below that, the land belongs to the Indian Nation. Since, by tradition, the women till the land, the title to the top few inches of ground is for the most part vested in the distaff side of the tribe.

To acquire borrow pits or waste areas, contractors working in the reservation were forced to make two transactions—the substrata they purchased from the tribe while the top dirt they bought from the squaws. One contractor, in fact, may well wind up buying the same ground three times. Individual land titles are not too clear, and after paying a purported owner for a considerable amount of borrow taken from tract, the contractor discovered by way of a law suit (still pending) that another Indian apparently owned the land.

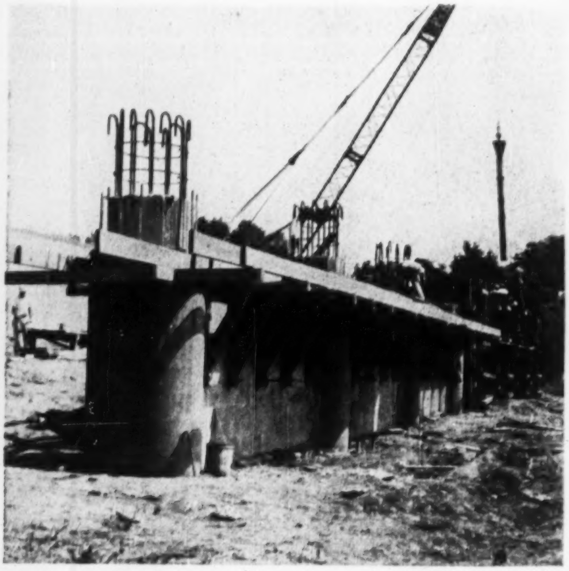
Of a more serious nature, have been the steel shortages and cement strikes that have plagued the job since its inception in 1955. None of the highway's 86 bridges are designed in precast or prestressed concrete, so the structural requirements are appreciable—more than 33,600 tons. Furthermore the 9 in. pavement will take 911,000 barrels of cement in its 588,000 cu yd of concrete.

• **Weather and clay**—Last year's wet weather was anything but an aid to maintaining production schedules. Of the 21 working days in July, rain fell on 17. August, September, and October were somewhat better, but the earth throughout the thruway area is such that one heavy rain can almost stop construction for a week. Much of the terrain consists of a sandy silt underlain by an impervious blue clay. Even where clay excavation was no problem, the water it held was. In many cases the contractor had difficulty moving his equipment around on the wet sandy silt, and often he had to dry out borrow before he could compact it.

One outfit—the Yonkers Contracting Company—has the three contracts where the clay itself is giving trouble. And there, several stretches of the road are not being built according to plan but acording to a clause in the specifi-



MUCK SPEWS from top of air lift during cleaning of piles at Cazenovia Creek.



"FORM-FITTING" concrete encases piles and ties them together on Thruway bridge near Buffalo.

cation that permits the project engineer to vary the excavation quantities as required by job conditions. On several occasions, the contractor has completed the excavation to plan grade, set up his paving train, only to have the engineer decide that a clay pocket was too close to the subsurface, and must be removed.

In one place—near Onthank Road in Chautauqua County—in a cut section, a decision was made to place the normal gravel subgrade immediately over the existing clay. The brand new paving over this area promptly failed. Approximately 100 ft of concrete was removed, but, because the excavation of the offending clay would have resulted in undermining the adjacent paving, it was decided to put additional sandy fill over the clay and repave.

• Working on a mattress—In sections where the clay must be excavated, the job is one for a dragline. No equipment, either on wheels or tracks, can work while standing on the material. The contractors who have tried it agree that it is like working on a mattress.

The results have been rough on contractors and construction schedules alike.

In one short stretch of road near Farnham, Yonkers Contracting expected to short-haul about 1,000 cu yd per day with each scraper on the job. As it turned out, scrapers could not be used at all—and with ten machines (two draglines, six 10 cu yd rear dump trucks, and two bulldozers) the contractor at no time could equal the production he had expected from a single scraper.

Another contractor handicapped by weather and soil conditions is Johnson, Drake & Piper, who had some of the biggest fills on the Erie Thruway. At the 2 mile, $7.5 million Cazenovia Creek Crossing just south of Buffalo, JD&P had to place and compact 1.6 million cu yd of fill. With fifty 14 cu yd trucks making a four-mile run from the borrow pit to the site and with two 2½ cu yd shovels and two belt loaders filling the trucks, the contractor for the most part was able to average only 8,000 cu yd of fill per eight-hour shift during last year's wet spell. According to project manager Louis G. Hecht, much of the time the belt loaders could not be used in the wet sandy silt, and trucks had to be helped out of the borrow pit by dozers.

• Piles are columns—Except for the two twin concrete arch bridges near Silver Creek and a welded five span bridge over Cattaraugus Creek between Erie and Chautauqua Counties, all of the bridges on the Erie section are beam type of composite construction.

The biggest of these bridges is the 520 ft, six-lane, eight-span Indian Church Road crossing in suburban Buffalo. This bridge, and two others at the northern end of the Erie section are supported by 30 and 36 in. dia ½ in.-wall steel cylinders that serve as both pile foundations and piers. Officially called cast-in-place tubular piles, these concrete filled units are seated in rock and extended upward above the ground to the pile caps which is directly under the deck steel.

Although the use of piles as direct supports for bridge deck is not new, there are few locations in the United States so favorably suited as the Buffalo area to the use of large piles. John Monson, superintendent for Herbert F. Darling, general contractors who installed the piles for Buffalo Creek, Cazenovia Creek and Indian Church Road bridges, reports that 36 in dia piles were driven 30 ft to rock in as little as 20 minutes—and it required only a 15,000 ft lb hammer to do the job. A special driving head was needed and since a 36 in. pipe will not fit inside standard pile leads a frame was built to carry the hammer outside of the leads.

While the actual driving was easy, spotting the pile properly was not. Specifications permitted a deviation from planned pile location of only 1 in. at the cut-off. In cases where the piles were knocked off line by subsurface obstructions, it was necessary to dig out the obstruction (usually a boulder), refill the hole and replace the pile.

• Getting 'em down—After the pile was seated on rock, cleaning it was another problem. Darling used an auger, an orange peel and an airlift with varying results. An airlift did not remove any of the sticky blue clay encountered at the Indian Church Road Bridge where 74 piles 30 in. in dia were driven 50 ft. At Buffalo Creek where 36 in. piles were driven 34 ft, the contractor used

CERTIFIED
OWNER
REPORT

Sturdier construction, combined with exceptional stability and 180° foot-pedal swing-control, enable the Case "320" industrial backhoe to outperform competitive rigs costing as much as $2000 more.

Home-builder says: "CASE® '320' CUTS SEWER and WATER INSTALLATION COSTS in HALF"

HARVEY CONSTRUCTION CO., 2126 Highland Park Way, St. Paul, Minn., is constantly looking for *new ways to* cut costs, and improve job efficiency on their *1200-home* Woodbury Heights development.

As a result, they recently traded their converted *farm-type* power-digger, for a new Case "320" *industrial* loader-backhoe combination. The Case unit was selected after a thorough competitive demonstration, because of its heavier construction, superior performance *and lower cost.*

Unit-cost per home reduced

Company records prove the choice was a wise one because the Case "320" has already *cut the cost of digging and backfilling water service lines and sewer systems by 50 per cent.*

Says owner Harvey Lubov: "We've been able to greatly decrease our unit-cost per home for installing water and sewer systems. Because the Case backhoe has more power and is easier to maneuver, it can dig an average trench — 7 ft. deep, 3 ft. wide at the bottom, and 65 ft. long — in an hour and a half. We now complete *four* such installations per day, compared with only *two* per day with our former machine. We've also cut the time of installing septic tanks and drain fields by 33 to 50 per cent."

Handles utility jobs!

Lubov saves additional time and labor by using the "320" for various handy-man jobs. With the 13-cu. ft. hydraulic self-leveling loader, he loads trucks, lifts materials, cuts sidewalks and driveways, fine-grades and spreads gravel with the machine, instead of by hand. Says Lubov, "The Case rig is big enough to do a fast job, yet small enough so it doesn't damage new foundations."

You, too, can save money and increase efficiency with a Case "320" backhoe-loader. See your nearest Case Industrial Dealer today, or mail handy coupon below.

Lubov's operator says the high-speed Case shuttle transmission and "one-finger" power-steering are a big advantage on loader jobs. Wheels do not jackknife when turning, and the big tires do not "sink-in" under heavy loads, as former machine did. He also appreciates the ease of reaching all tractor-controls from the backhoe seat.

CASE

1st in quality
for over 100 years

INDUSTRIAL WHEEL and CRAWLER
TRACTORS • LOADERS • DOZERS
BACKHOES • FORK LIFTS

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☐ Send free catalog on Case "320" Backhoe-Loader
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C-81-91

SUBMERSIBLE

SEWAGE and SUMP PUMP

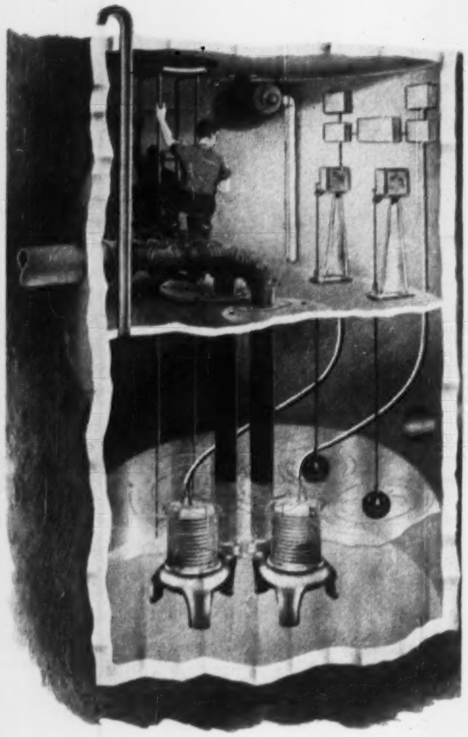

Illustration shows an economical installation which **does not require a pump house** to mar the landscape. This reduces the overall cost of the installation.

Engineered for

HEAVY DUTY DRAINAGE

DIFFICULT SEWAGE PUMPING

UNDERGROUND LIFT STATIONS

HIGHWAY UNDERPASS DRAINAGE

SUBMERGED OPERATION

Features

The new non-clog bladeless type impeller, the most efficient design for handling rags, stringy material and irregular solids with the liquids. 4″ pumps will pass 2½″ solids; 5″ pumps will pass 4″ solids.

The weil Submersible Non-Clog Sewage and Sump Pump is a pump designed to operate completely submerged under water. The only consideration where depth of setting is concerned is selection of the proper unit so that pump will have sufficient head to pump out of the sump. Pump can be installed and removed with low headroom above the wet pit. The submersible ejector is the same compact close coupled unit regardless of the depth of the pit.

Wide Range to Select From

The Submersible Ejector is available in discharges of 3″, 4″, 5″ and 6″ with heads to 60′ and capacities to 2000 G.P.M.

Low Installation Cost

Simplicity in installation which requires only one piping connection and low maintenance due to the hermetically sealed motor assure economical installation and trouble-free operation.

Send for Bulletins SE-860 and SE-862.
See **weil** catalog in Sweet's 1957 and Domestic Eng. Cat. Dir. 1957.

weil PUMP COMPANY

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. . . Erie Thruway delayed

SPECIAL DRIVING head was used for installing 30 and 36 in. dia piles.

both an auger and an airlift while at the similar Cazenovia Creek Bridge the airlift did most of the cleaning.

For final seating of the piles after the earth was removed from them, men were sent to the bottom of the shells with jackhammers. Their job was to dig a hole two ft deep in the rock—big enough to accommodate the base of the pile, or to drill holes for dynamite to blast the rock. The pile was then redriven so as to seat itself firmly in the rock at the base of the hole. Pressure grouting through a previously burned hole at the base of the pipe filled any voids outside the pipe and anchored it solidly in the rock.

For protection at ground line, all piles were encased in concrete either by collars or solid walls. On the bridge which crosses Indian Church Road and four tracks of the Pennsylvania R.R., three of the pile bents were encased in crash walls 42 in. thick, 140 ft long, and 10 ft high. The rest of the piles were encircled at the ground line by 4 ft high, 6 in. thick collars of reinforced concrete; 3 ft of the collar is below ground while the remaining 1 ft is above. At Cazenovia Creek the piles were completely encased from below the ground line to the top with a form-fitting concrete shell which is part of a wall the full length of each bent.

Expensive as this procedure is, it still costs considerably less than standard methods. The large concrete pile used as a pier offers great economies in spanning rivers where cofferdams would normally be needed, and in erecting bridges adjacent to highways and railroads where form erection is hampered by traffic.

NOW..3 new International V-8's

Now you have an even wider selection of economical International gasoline or LP-gas power for your driven machines—three new power-packed, compact V-8's—the UV-549, UV-461, and the UV-401.

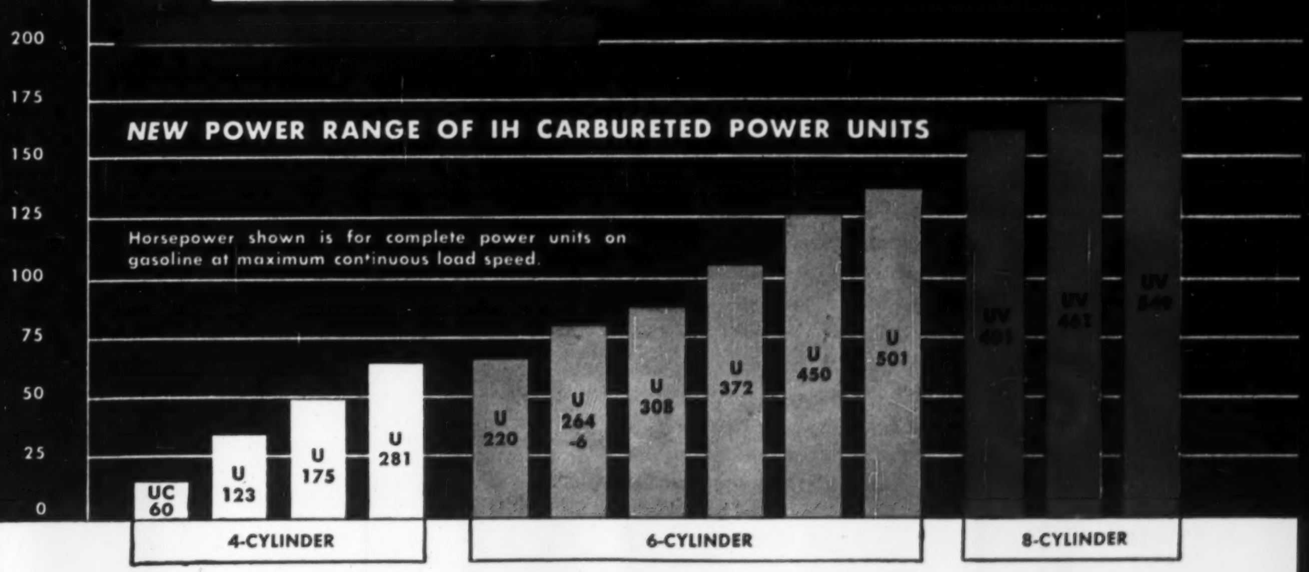
NEW V-8 UV-549 POWER UNIT. 208 net hp @ 2,600 rpm on gasoline, complete as shown. Not shown: UV-461 Power Unit—174 net hp @ 2,600 rpm, and the new UV-401 Power Unit—160 net hp @ 2,800 rpm.

INTERNATIONAL
UV-549

These new models increase the International carbureted line to 13 models ranging from 16 to 208 hp on gasoline at continuous rated rpm, complete with regular accessories, fan and radiator. As stripped engines, they develop from 17 to 257 hp. LP-gas power is approximately the same as gasoline.

And just look at the standout V-8 features that help you cut your operating costs: rigid, Y-shaped block; short-stroke, heavy-duty, camground, 4-ring aluminum pistons; big, smooth-running, counterbalanced, tocco-hardened, 5-bearing crankshaft; large-area, long-life, tri-metal, replaceable bearings; combination full-flow, by-pass filter for long-life pressure lubrication; full-power, down-draft carburetion; oil cooler; and a 12-volt electrical system.

See the man who can expertly fit one of these 13 extra-value carbureted engines to your job—your nearby International Power Unit Distributor or Dealer. You'll discover his after-sale service, his shop and field service facilities, his parts stock is outstanding in the industry.



INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Power Units . . . Motor Trucks . . . Farm Tractors and Equipment.

Don't let an old-style single-action loader

see how a 4-in-1 multiplies your

You've got a gun in your back two ways—with an old-style, single-action "dip-and-dump" tractor loader!

It holds you up on price, by giving you only the one machine action for your money. It hijacks your profits, by drastically limiting your job range and capacity.

Now, see what a contrast, in multiplied value and earning power, an International Drott 4-In-1 offers you!

4-machine utility... one-machine price!

An International Drott 4-In-1 gives you four built-in, multiple-duty, big-capacity machine actions, for only a one-machine price. Your fingertip command, through the "machine-selector" lever, instantly puts any 4-In-1 action you need at your service.

Skid-Shovel action gives you exclusive, "concrete-smashing" pry-action break-out—with famous bucket-heaping, ground-level roll-back. "Carry-type scraper" is your accurate grading, stripping, spreading, or compacting action. Clamshell action provides one-gulp "stand-and-fill" ability, plus hopper-high, self-cleanout, bottom dumping. Bulldozer action delivers aggressive, big-yardage, earth-rolling ability.

Ease into the foam-cushioned seat—prove that your 4-In-1 investment will multiply your job-taking, money-making ability. And compare the performance protection of exclusive shock-swallowing Hydro-Spring to unprotected hose-bursting, machine-mauling "lunge-and-lift" design. Ask your International Drott Distributor to demonstrate the top buy by far in the construction machinery world: the 4-In-1 size that fits your needs!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL®
DROTT®

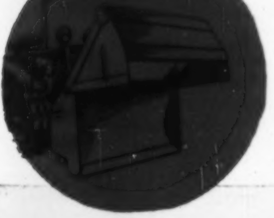
As a space-saving clamshell, this TD-6 4-In-1 "surrounds" a pile of loose dirt—gives speedy, space-saving "stand-and-fill" action. The 4-In-1 is backfilling, grading, and landscaping on the grounds of new Canisius high school, Buffalo, New York—for Michael Wagner & Sons, Inc.

hold you up...

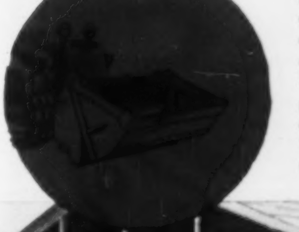
profit-range by four

Doing as much as three power shovels and a dragline, this TD-18 4-In-1 dug up, and loaded, up to 1,700 feet of old concrete pavement daily —for Henry E. Berghuis, Prinsberg, Minnesota. Famous International Drott pry-over-shoe break-out action makes the big difference over other rigs!

Earth-rolling 4-In-1 bulldozing action saves Lotz Excavating Service, Chicago, Illinois, the time and expense of putting a blade-equipped unit on the job! See how their TD-14 4-In-1 strips heavy, hard-frozen sod from a homesite—to dig a 150 cu yd basement, in only 2¼ hours (average).



"Carry-type scraper" grading with inch-close accuracy is another job-getting 4-In-1 specialty that single-action rigs can't possibly do. This TD-9 4-In-1 is making big savings by putting new home landscaping on a "production-line" basis. You can also strip and spread with this easy-to-control action!



These TD-24 full-time let you run power circles

Exclusive, all-weather, seconds-fast International gasoline coversion starting. Direct combustion heat conditions the TD-24's engine, seconds-fast—for full diesel performance. You avoid the warm-up delays and service complications of a surplus starting engine—earn money while "slow starters" are warming up!

Exclusive International Cerametallic-faced engine clutch action. The TD-24 is the only king-sized crawler with this big feature. Immune to heat and cold, this long-lasting clutch gives full-load power-transfer efficiency—anywhere, anytime! This dry-type clutch of simplified design eliminates "high frequency" servicing demanded by clutches with "cooling systems."

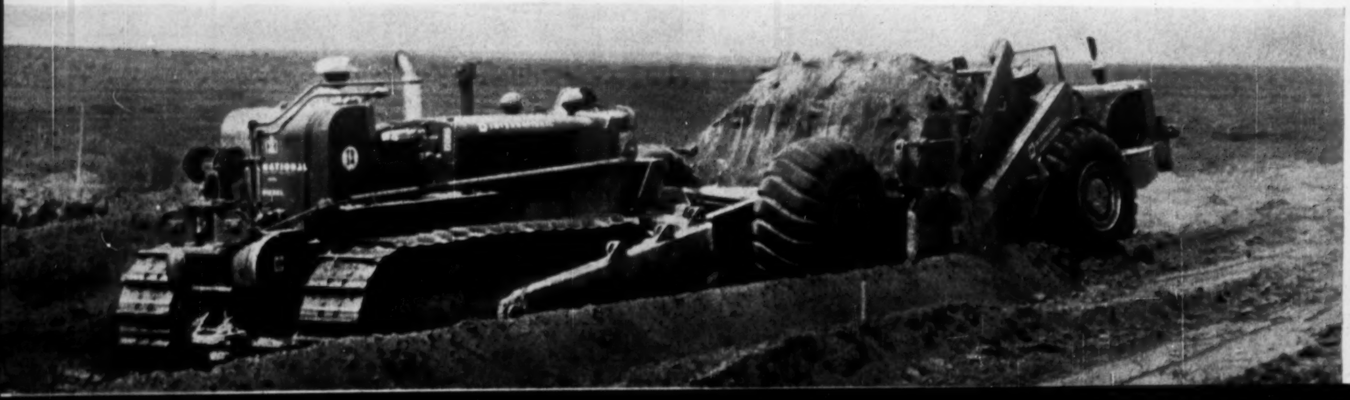
Exclusive, years-proved Planet Power steering. Why put up with load limiting "dead track drag" on the turns in a king-sized steering clutch crawler? Why not profit from TD-24 Planet Power steering that enables you to pull or push as big a load on the turns as on the straight-away? See how TD-24 two-track turning power never backs off from a load. "Take the turn" to new profits with Planet Power steering!

Exclusive cycle-speeding on-the-go shifting. In either Torque-Converter or Gear-Drive model, the TD-24 gives instant stall-preventing Hi-Lo shifting, without stopping or even declutching. Fingertip matching of speed to load under full power gets the job done sooner!

Exclusive TD-24 fingertip operating ease provides the operator comfort incentives and the means to give full days of full capacity cycle-speeding production!

Find out how these and all the other TD-24 production exclusives can equip you to run power circles around anything else on tracks. See your International Construction Equipment Distributor for a TD-24 demonstration!

Planet Power steering and Hi-Lo "power-crowd" keeps the TD-24 loading the "75" Payscraper® at top effective speed—adds up to increased daily yardage. Only 30 to 45 seconds needed to heap-load a "75" Payscraper—on this Dominic Leone Construction Co., Inc., Colorado road job!



production exclusives around "cycle-stallers"

Even with such offset loads as a boulder-bucking angled blade—benching a road round a hill—TD-24 Planet Power steering lets you concentrate the power where you want it. You stay on course—production stays up!

On slam-bang rock-dozing or moving other heavy materials, instant TD-24 Hi-Lo shifting adjusts tractor power to load resistance—increases production, avoids delay! And you get fast reversing to speed shuttle-dozing!

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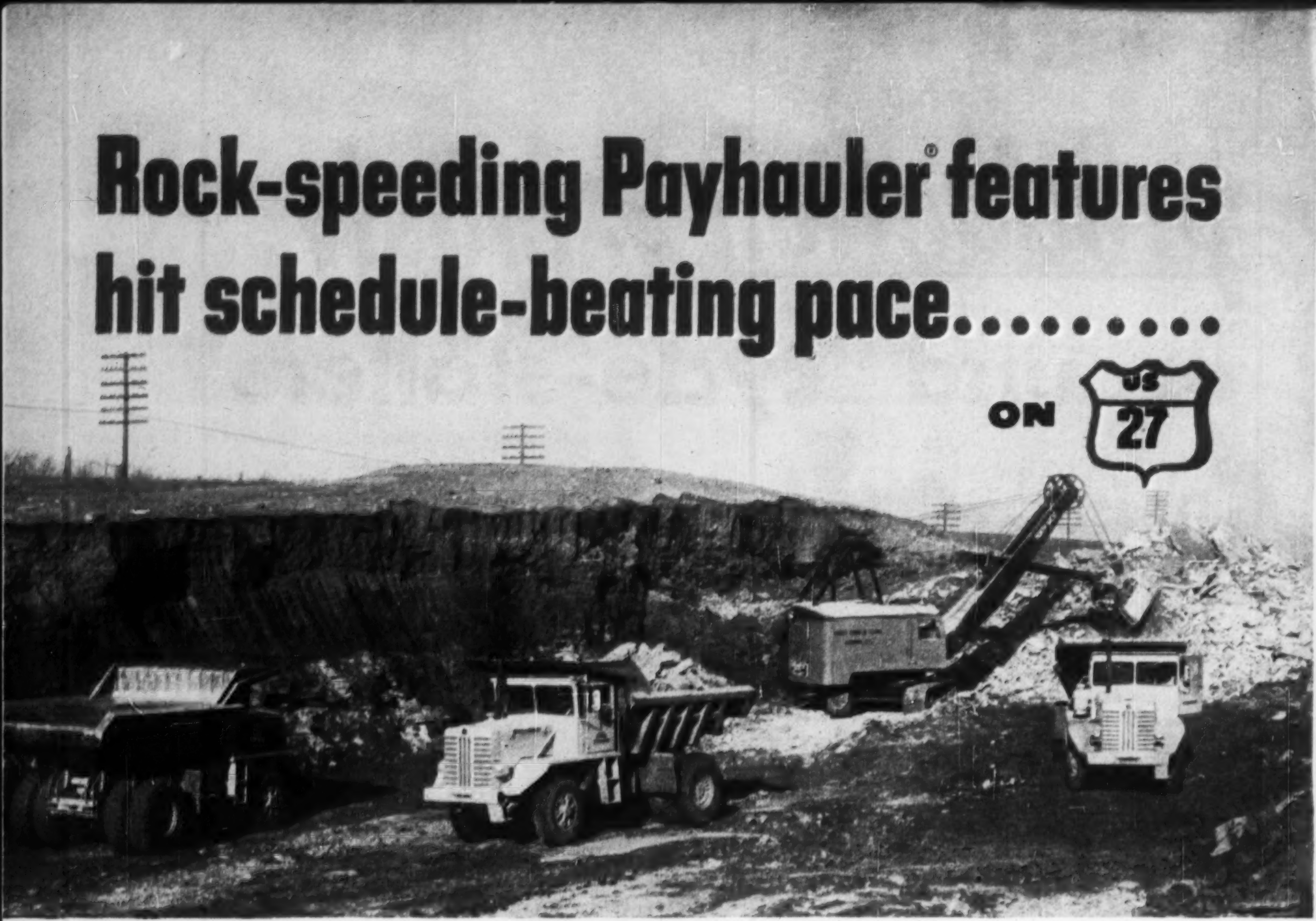
Rock-speeding Payhauler® features hit schedule-beating pace..........



The three-unit "65" Payhauler fleet of Greer Brothers and Young, highball 2,000 cu yd of rock 1,200 feet daily. Rock-moving climbed 'way ahead of schedule, on this U. S. 27 relocation job near Lincoln, Kentucky!

Both Payhauler sizes—the 18-ton "65", and 24-ton "95"—have built-in, schedule-beating performance!

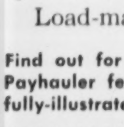
Exclusive high reverse and "zip-around" power steering gives a Payhauler regular "pick-up truck" spotting ease. The "big-target" Payhauler body speeds the shovel's dip-and-dump cycle.

Load-matched and road-matched turbo-charged diesel power gives these heavy-duty, off-highway haulers super-fast get-aways. Next-to-automatic Payhauler control gives safe, capacity-adding speed—even over rough terrain! The "65" can roll at 36.4 mph; the "95" at 38 mph!

And the double-acting hydraulic hoist, *under full controlled power both up and down,* contributes cycle-speeding 10-to-12-second Payhauler dumping!...Extra speed on every job-phase adds up to extra profit-tons hauled!

See how a Payhauler on your job will give you a decisive, profit-margin of difference! See your International Construction Equipment Distributor for a demonstration!

Find out for yourself *all about* all the big-money-making Payhauler features. Send for your free copy of this new, fully-illustrated Payhauler catalog!



International Harvester Co.
180 N. Michigan, Chicago 1, Ill.

Gentlemen:

☐ I am a contractor. ☐ Am interested in becoming a contractor. ☐ Am an equipment operator (please check square that applies.) Send me Payhauler Catalog (CR-603-G)

Name____________________________________

Street Address_____________________________

City________________________State__________

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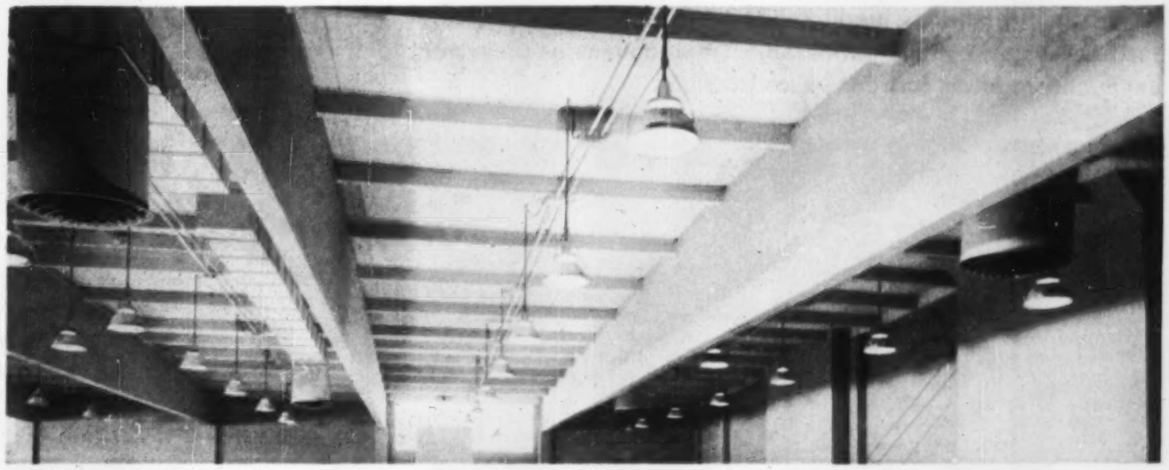


New span record for timber beams is set at Ashland, Ore., where . . .

Laminated Wood Beams Span 130 Feet

A record span for wood beams is believed set by glued-laminated timbers supporting the roof of a new physical education building at Southern Oregon College of Education, Ashland, Ore. The huge members have an overall length of 130 ft 8 in. and span 129 ft 7 in. c-c of bearings.

Although only 9 in. thick, the beams have a minimum height of 48 in. (at the ends) and reach a maximum of 80 in. at the center. They were manufactured with a camber of $10\frac{3}{4}$ in. at the center.

The large height-thickness ratio—almost 9—ordinarily would have necessitated lateral restraint for both the top and bottom edges of the members. (Maximum height-thickness ratio for beams restrained only along the upper edge is set at 5 by the "National Design Specification for Stress-Grade Lumber and Its Fastenings.") But architectural considerations in this case made it desirable to avoid bracing between beams except as provided by the purlins and deck along the top edges. Consequently, it was necessary during the design stages to investigate the lateral stability of the beams.

In the planning stage, the use of other types of members besides beams was explored, including both steel and wood trusses. But for esthetic and architectural reasons, the beams were selected, even though they added moderately to the cost.

The beams were designed for 30 psf live load and 15 psf dead load at a spacing of 18 ft 8 in. Laminations are $1\frac{5}{8}$ x 9 in. Douglas fir planks.

The stability studies were made by Robert F. Scherzinger, structural engineer now in private practice but then in the office of A. D. Harvey, Medford, Ore., consulting engineer for the job.

A model was constructed to $\frac{1}{10}$ scale from vertical-grain Douglas fir, with the grain oriented to duplicate as nearly as possible the construction of the actual beam. To simulate the lateral restraint anticipated from the roof deck and purlins, a sheet of $\frac{1}{4}$ in. plywood with $\frac{3}{4}$ in. wood cleats was attached to the top of the model. Heel connections were also constructed to scale, to approach as nearly as possible the degree of end fixity expected for the full-size beams. Concrete blocks were used to load the model. Both vertical and horizontal deflections were measured at the quarter points by means of fixed scales external to the beam, and knife-edge indicators attached to the beam.

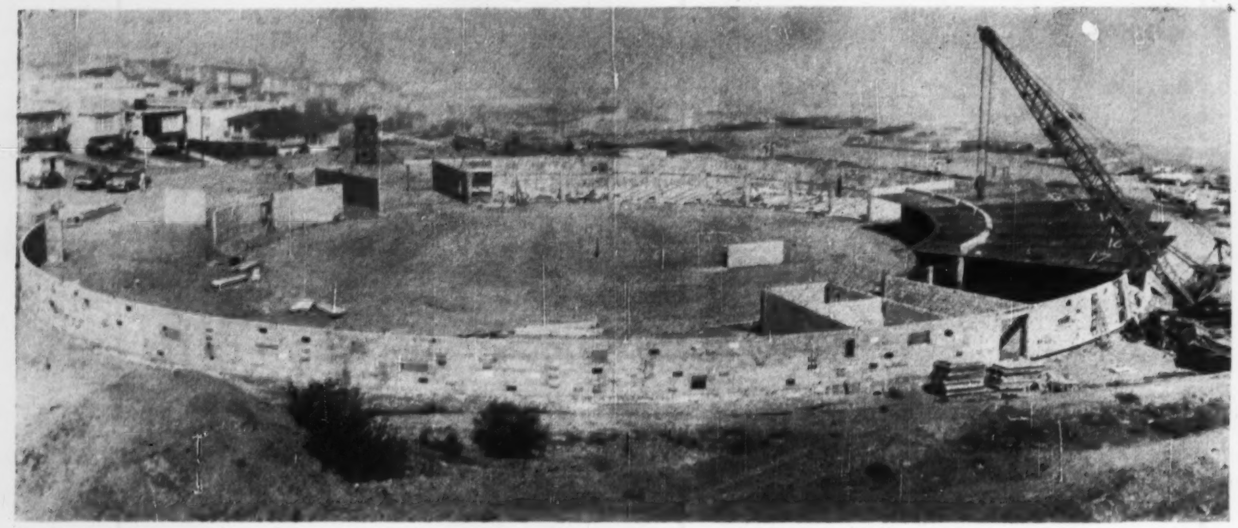
Various loading conditions were simulated, including a 5,000-lb concentrated lateral load on the tension edge of the beam, and 141% of the full design vertical load uniformly distributed. Actual vertical deflections of the model agreed closely with scaled-down calculated values, showing it to be a reliable indicator of the prototype beam's behavior. Mr. Scherzinger concluded after all the tests that the beams would be completely stable laterally.

Architect of the project was Howard R. Perrin, Klamath Falls, Ore. Bessonette & Graff, Medford, was the general contractor. Timber Structures, Inc., Portland, Ore., furnished and erected the laminated beams.

MODEL STUDY of beam was made because of large height-thickness ratio.

DEFLECTIONS were scaled horizontally and vertically at quarter points of model. Concrete blocks were used to simulate various loading conditions.

Unusual site conditions made construction of circular shaped school structure feasible. Shape permitted such economies as precasting roof panels and reduced corridor space possible.



CIRCULAR SCHOOL structure at Daly City, Calif., has 14 classrooms around the perimeter. Playground is in center unroofed area.

Precast Hipped-Plate Panels Form Roof

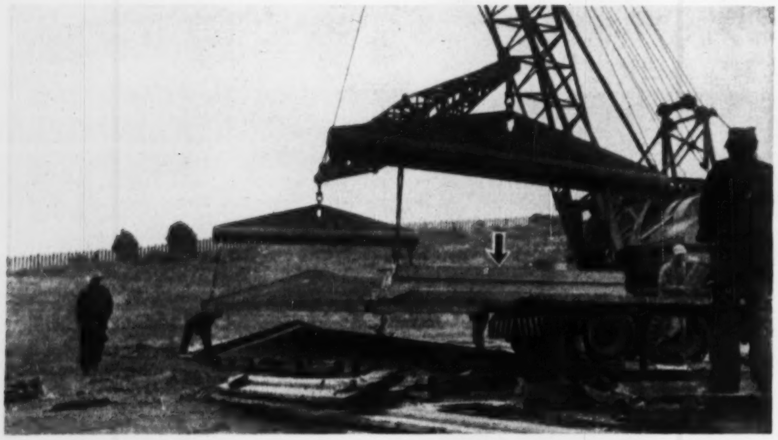
A steep, wedge-shaped site, limited funds and an architect's desire to avoid repetitious standardization in school design led to the use of precast concrete hipped roof panels for the circular-shaped Vista Mar elementary school, Daly City, Calif.

The circular building is placed in a bowl about 60 ft below the upper street level. Its unusual roof design will contribute to its appearance—from above as well as at grade level.

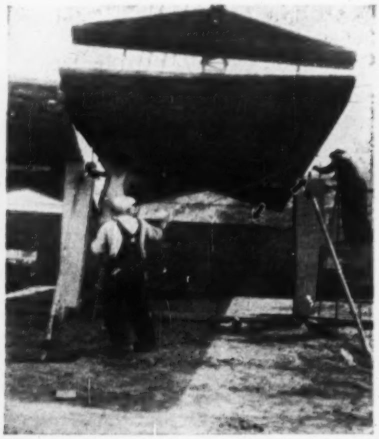
Precasting of the roof panels permitted construction of the concrete building within the rigid limitations of state aid financing. The cost maximum for state aid schools in California is based on $14.18 per sq ft for a standard classroom, which usually results in wood frame construction. Yet, by use of the precast roof, construction costs were so reduced as to permit the use of a reinforced concrete structure.

• **Why this design?** Architect Mario Ciampi of San Francisco settled on the circular design after considering ways to use most economically the scant 4½ acres of level land available. The site limitations, which dictated the size of the school and made future expansion out of the question, further cleared the way for a circular building.

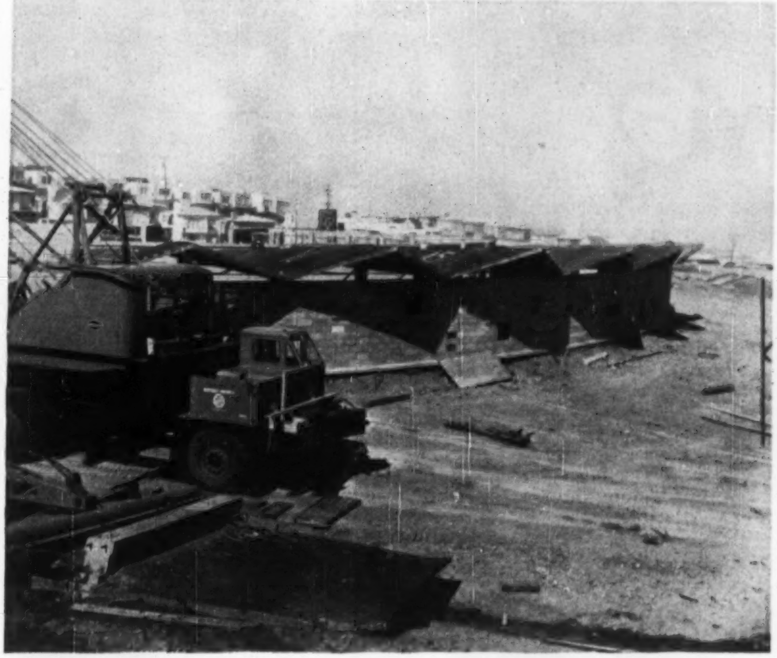
In addition, the circular building provided several economies that helped get more for the construction dollar. For one thing, the single hallway eliminates about 3,000 sq ft of space normally used for corridors in a school of this



SPECIAL LIFT RIG removes panel from casting bed after seven day curing period. Each panel is 48 ft long. Transverse beam (arrow) reinforces panel at column supports.



PANELS are tied to pipes on the wall and on the tapered columns (arrows).

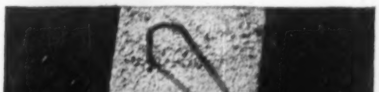


PRECAST CONCRETE PANELS roof school and cantilever over exterior wall.

# of Circular-Shaped School

size. A bonus benefit is found in mechanical features of the building, such as wiring conduit placed around the inside perimeter. Most conduit is precast into the roof shells.

Within the building are 12 classrooms, two kindergarten rooms, a special activities room, administrative unit and dependent facilities. Included in the per-square-foot cost of the school is a separate multi-use building, also circular, which will serve as a community center.



CONDUITS and reinforcing bars are joined and the separation concreted.

The total construction cost of the school and multi-use building, including site development and utilities is $481,695. The total floor area of both buildings is 22,600 sq ft.

An enclosed central garden and play area offer two benefits: one is protection from prevailing cold ocean wind and fog in the area; the other is easy maintenance of an attractive central garden.

• Precasting is the crux—Key to the success of the project was economical building of the unusual roof. This problem was solved by Isadore Thompson, San Francisco structural engineer, who worked out the structural details of the building. Precasting the roof offered a way of holding the cost line.

Hipped-plate, or folded-plate, roofs consist of a series of inclined flat slabs attached along their edges to give each other mutual support. Thus, between external supports, they act in the same way as would inclined deep girders.

The hipped shells that make up the roof are 4 in. thick over most of their area, and they span 48 ft. Transverse and longitudinal No. 3 reinforcing rods are used both top and bottom, with some of the bottom rods being as heavy as No. 5's. At the third point, where the transverse supporting beam is tied into the roof, No. 5 diagonal reinforcing rods are used.

Two shells form the roof over one classroom. The total of 41 shells in the building were precast on six casting beds made of ⅝ in. birch plywood on a framework 2 x 4's laid on sand ballast. The 16 ton shells, cast of 3,750 psi, 8.31 sack lightweight concrete (105 pcf), were removed for storage after curing to 3,600 psi in seven days. Since reinforcing steel placing time ran from 8 to 10 days, about three weeks was required in order to precast each roof section.

• Framing—For erection purposes, a tie rod is placed just above the support points of the high end of the hipped shell to act as a tension tie to prevent spreading. It is removed as tie-ins are made. Designed as an arch at this point, the shell has a slightly increased thickness above the top of the arch.

At the opposite end of the shell, which faces the inside perimeter of the building to form a corridor covering, there is an integrally cast concrete beam to give greater strength to the flattened end at the inside support points. All four support points are boxed out to fit over 2 in. pipes cast into the columns and walls.

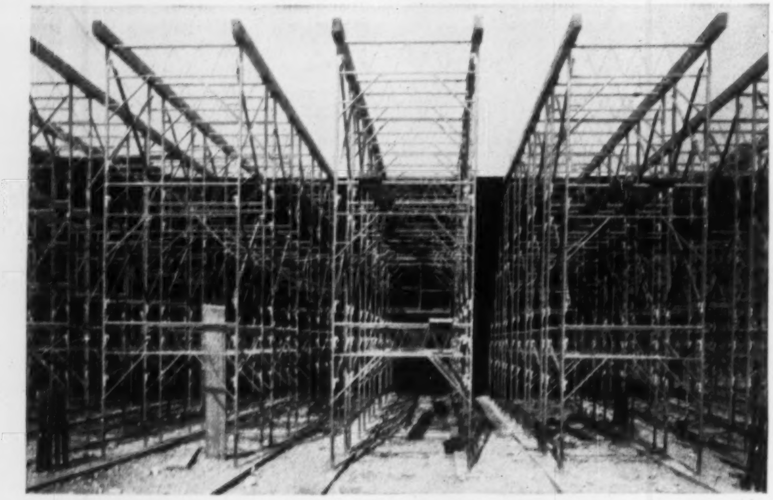
The roof is supported on concrete block walls (or precast bents at wall openings) on the outside perimeter and on precast tapered columns, 8 ft high, at the inside perimeter. Four No. 7 vertical reinforcing rods at the corners and two No. 9 rods at the center with stirrups of No. 2 rods spaced at 6 to 7½ in. make up the column reinforcement.

Two 2x3/8x6 in. plates, cast integrally at the boxed-out section of the roof, are welded to a 2 in. pipe protruding from the column by means of a collar plate. An additional tie is provided by welding a reinforcing rod between the two protruding No. 9 rods which pass from the column to the roof section. Full continuity is thus provided between the column, the beam and the shells to resist earthquake forces. Similar connections are made at the concrete block exterior wall except for the reinforcing rods.

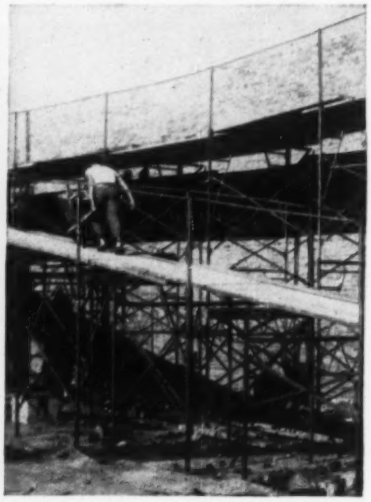
After the various units are welded together and electrical conduits are joined, a blocked out opening between shells will be formed up and filled with concrete. A space of less than an inch between shells closes up as the temporary tie rods are cut loose. This will finally be grouted.

The contractor, Hart & Hynding of San Francisco, is using grouting and dry pack to provide for a slight vertical adjustment of the inside support columns. The base of the columns is placed in a pocket with a grout pad at the bottom. Dry packing takes place at the top. As grout is forced into the pocket the column is raised to take on its full share of the roof load.

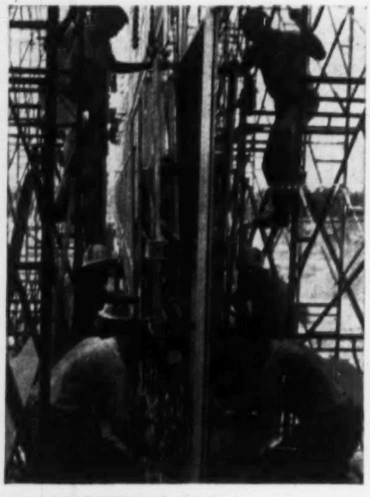
Scaffolding Methods . . . by Patent Scaffolding Co.



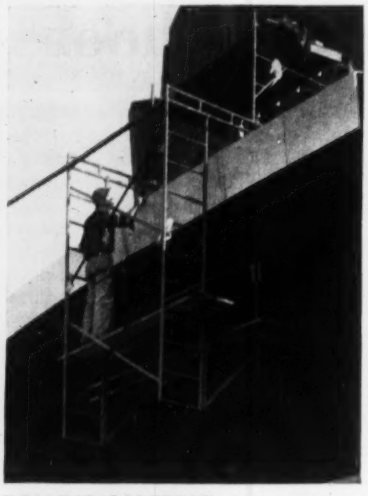
PREFAB SHORING FOR 12" SLAB—On a new 150' x 350', two-story building for Polaroid Corp., Waltham, Mass., general contractor Aberthaw Const. Co. needed support for a 12" slab. 4000 "Trouble Saver"® Shoring frames assembled in rows 3' and 3'6" apart easily provided for it. Job supt., Al Parsons, Jr., says "We found these shoring frames, braces and components very easy to handle. We know that this type of shoring goes up faster, cuts costs and gives us maximum access to the base slab for other work".



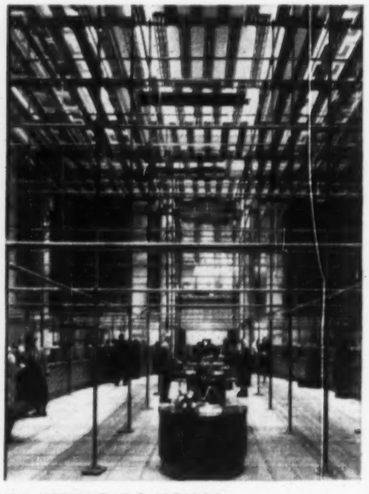
DOUBLE-DUTY—Both the wheeling ramp and the mason's platform in back are made from prefab sections of "Trouble Saver Scaffolding. Varying-height frames and adjustable legs achieve the slope. Terminal Construction Co., Woodridge, N. J., general contractor.



GLASS SETTING RIG—A special rig, developed by Pittsburgh Plate Glass Co., with 700 "Trouble Saver" Scaffolding frames for working platforms, places 8' x 11' glass panes for Conn. Gen. Life Ins. Co. new building, Hartford. Eight rubber cups grip panes, overhead crane lifts to position. Turner Construction Co., general contractor.



ROLLING SCAFFOLD—Unusual set-up is made of two 5'-wide, counter-weighed "Trouble Saver" Scaffolding frames on casters. 12'-trusses are attached and ladder frames hang below. Sidewall brackets make two-level platforms. Scaffold rolls around roof perimeter of new Dallas Memorial Auditorium. R. P. Farnsworth & Co., gen. contr.



BANKING AS USUAL—Smoke damage due to fire made a wash and paint job necessary at the Marshall and Isley Bank, Milwaukee. Painting contractor, Carl L. Ruhland, used "TubeLox"® Scaffolding with Featherweight Stages to provide working platforms for ceiling and high wall work above and to permit banking traffic as usual below.

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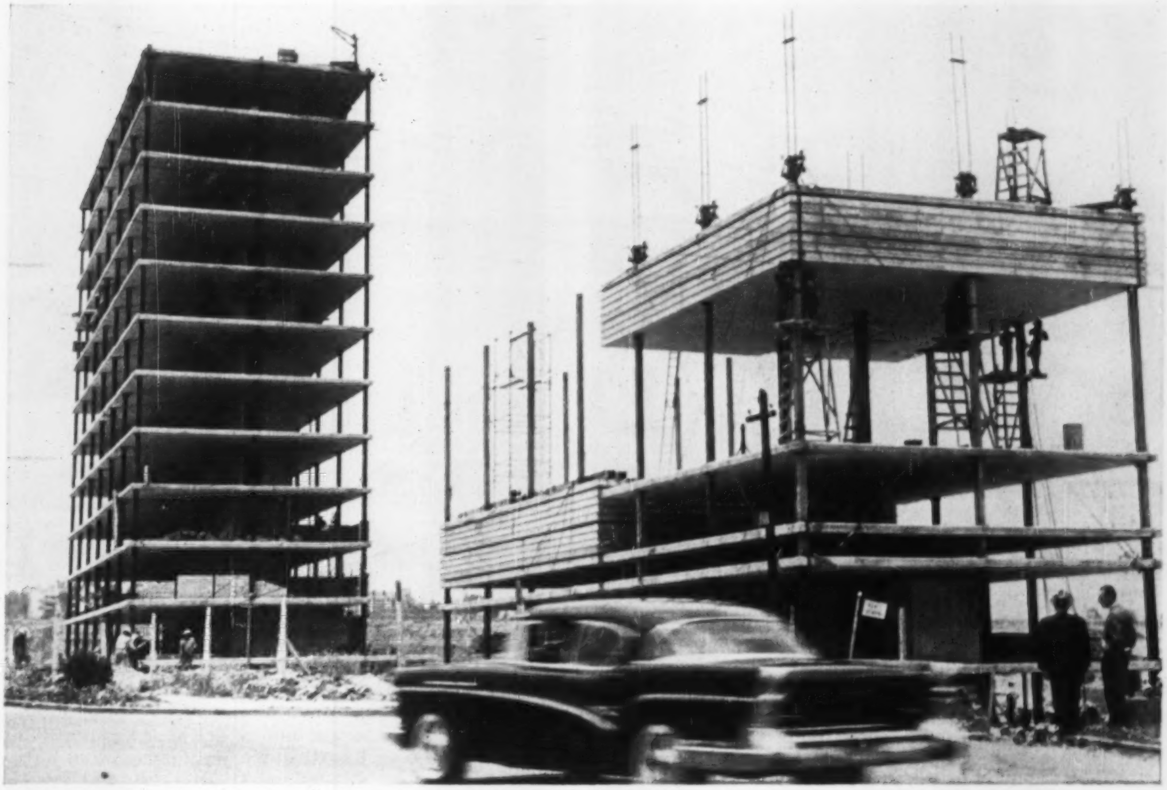


With erection of a 101 ft high apartment house . . .

Mexican Builders Set Lift-Slab Mark

The tallest concrete lift-slab building ever constructed is nearing completion in Mexico City. It is an 11 story-and-basement, 101 ft high apartment house.

The structure is part of a $5 million luxury cooperative apartment house project being built by Centros Urbanos, S. A., a private Mexican firm. Companion buildings are four 10 story apartment houses (also lift-slab type) and a commercial center.

• **Lift slabs may go higher**—Until construction of the new project, the tallest lift-slab building ever erected was the Citizens Security Corporation's 11 story, 77 ft high, pigeon-hole parking garage in Cincinnati (ENR May 3, 1956, p. 19). Still tops in the U.S.—but not for long—the Cincinnati garage will be surpassed in height soon by another 10 story lift-slab garage now under construction in Columbus, Ohio. And even the new Mexican building may be eclipsed in the not-too-distant future: Construction of a 16 story lift-slab apartment house is reportedly under consideration in Miami, Fla.

• **Box-section columns**—Erection of the slabs in Mexico City to the unprecedented height was facilitated by the use of welded steel box-section columns of uniform outside dimensions. The variations in column cross-section area required at different levels of the building were affected by changing the dimensions of the component plates without altering the outside dimensions of the columns.

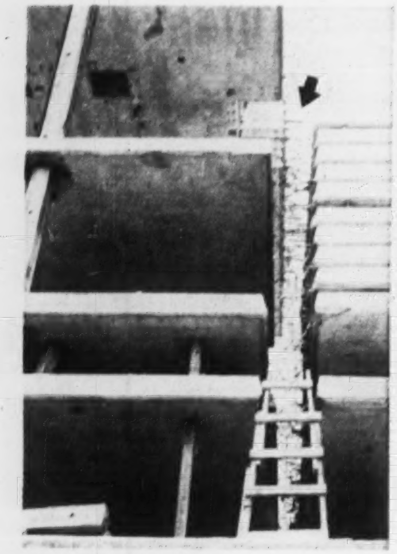
• **Floor construction**—All slabs are 10.2 in. thick and are of cored construction. Voids were formed by paper tubes. Concrete, which was tested at 2,000 psi, was mixed at the site.

All 12 slabs were concreted before any were lifted. In fact, it was actually 24 slabs, since each floor was cast and raised in two sections, joined later in the air by a cast-in-place strip that is 3 ft wide.

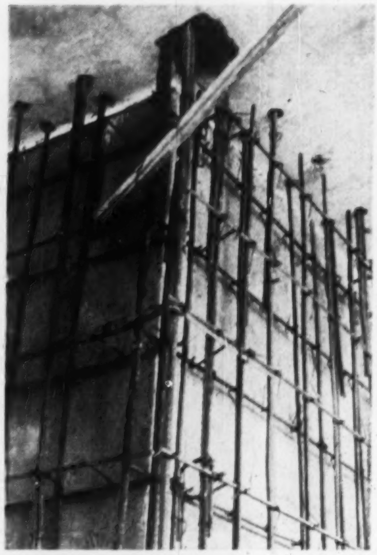
Plan dimensions are 39 x 112 ft, and these apply to the other four apartment houses, the major distinction among the five being the one-story difference in height. The two slab sections for each floor are 64 and 45 ft long, respectively, and 39 ft wide.

Horizontal shears in the building are resisted by three reinforced concrete shafts that rise from foundations to roof. These are used as elevator shafts and ventilating passages also.

• **Erection**—Lack of construction equipment (mostly imported and expensive), a problem for many Mexican builders, forced the contractor to improvise. He



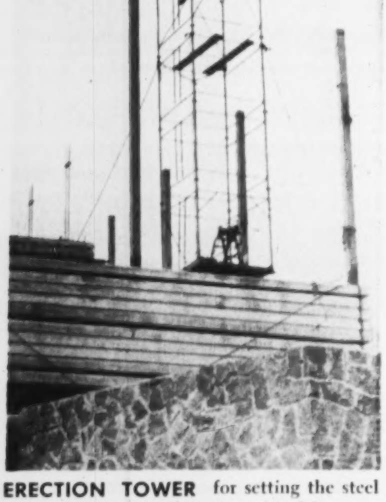
OPENINGS (arrow) between separately raised sections were concreted later.



REINFORCEMENT for shear walls passes through slabs to lap bars in next story.

lifted and plumbed the lowest column sections with a power shovel, and erected higher sections with a light-steel hoisting tower that rose with the roof slab. Five column sections end-to-end, spliced by welding, comprise the full height of the building.

▸ After the lowest column sections had been erected, all the slabs except those to be permanently connected to that tier, were hoisted to the top of the columns four at a time and temporarily supported by shear pins through the columns. Then the remaining slabs were hoisted to their assigned levels and permanently connected by welding the embedded steel lifting collars to the columns.



Next, the second tier of column sections were spliced to the first and the entire procedure repeated—and so on. The jacks and column-hoisting rig were shuttled back and forth from one end of the building to the other to keep floors rising on both sides of the open joint.

Construction of the shaft walls one story at a time followed closely the permanent welding of the floor slabs, thus stiffening the structure permanently as it rose. Temporary bracing for the floors was provided by crossed guy wires anchored to concrete deadmen.

The slabs were jacked from all the columns in the building grid—21 in all—the 64 ft slabs from twelve, the 45 ft slabs from nine.

The three concrete shafts are founded on a single concrete mat. Individual spread footings are used to support the columns.

The building was undamaged in the earthquake of July 28. (However, the shock intensity at the site is not known.) At the time all slabs had been raised and permanently connected and the concrete shafts had been completed.

When finished, the six buildings will have a combined floor space of 458,000 sq ft. They will cover 97,000 sq ft of the 237,000 sq ft site.

• **Financing hitch** — Originally, it was hoped that the entire project would be finished late in 1959. But Centros Urbanos' hopes of borrowing $1.6 million were dashed by a government request that lending agencies channel funds primarily to low-cost housing projects. As a result the firm has been able to borrow only $160,000. The plan now is to complete the project on a pay-as-you-build basis. The company hopes to realize some $700,000 from the sale of apartments in this first building.

Architects for the project are Augusto Alvarez and Enrique Corral. Job engineer for Centros Urbanos is Jose Luis Torres Landa. The builders are Lezama, Cortina y Cia., S. A., Mexican licensees of the Youtz-Slick patents held by the International Lift Slab Corp., San Antonio, Tex.

ERECTION TOWER for setting the steel columns rode up with the roof slab.

Syrian Railway Project Gets January Bid Call

An international commission representing three Arab nations has asked for bids for reconstruction of the 506 mile section of the Hedjaz Railway Line, which runs from Ma'an in Jordan southward to Medina in Saudi Arabia.

The Executive Committee for the Recommissioning of the Hedjaz Railway Line—formed by Syria, Jordan and Saudi Arabia—has asked bids for Jan. 30, 1958.

An engineering contract was awarded a year ago to IREX, the International Resources Engineering and Exploration Group, of Washington, D. C. The New York city consulting firm of Brown & Blauvelt, a member of IREX, designed the project and will supervise construction. IREX includes two other members—Jack Ammann, Photogrammetric Engineers of San Antonio, Tex., and Geophoto Services of Denver.

The railway runs from the Syrian capital of Damascus sough through Jordan to Medina. The section in question has been out of operation since 1917, when it was damaged in the revolts that brought down the rule of the Ottoman Empire. This damage—and 40 years of neglect—are said to have rendered the southern portion of the line useless, and will necessitate complete reconstruction of its facilities.

An unusual aspect of the bid call is that the committee requires that the contractor arrange financing of the $15 to $20 million project. With his bid, the contractor is expected to submit terms for providing financing on the basis of payment to him in 12 annual installments, starting two years after construction has been completed. The payments will be guaranteed by the three governments.

(International continued on page 70)

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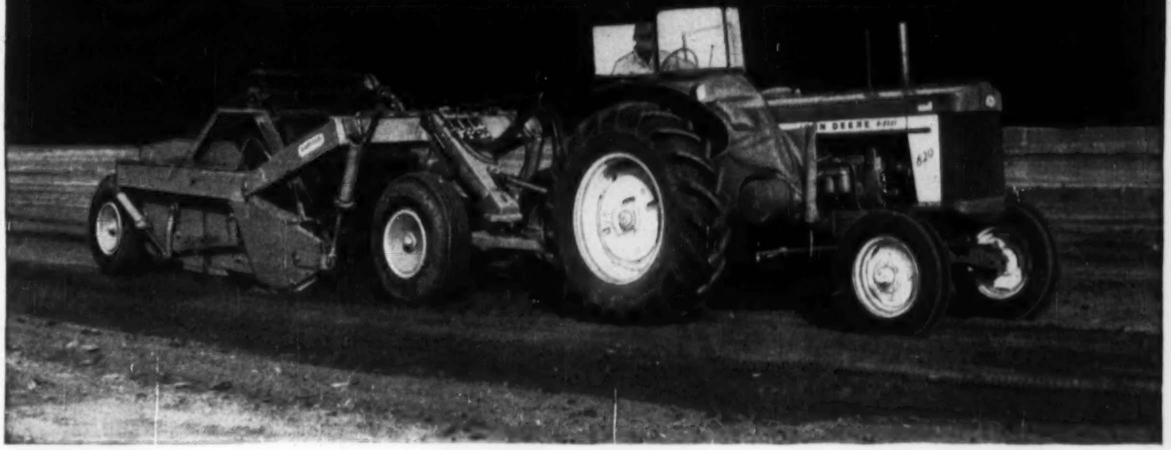

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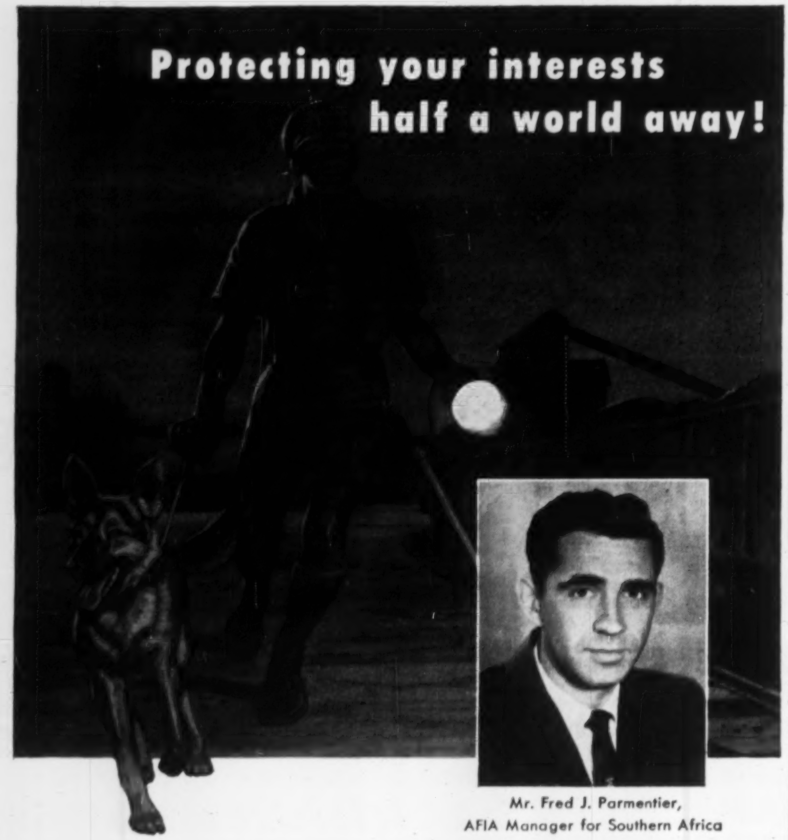

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Building Pace Mounts In Buenos Aires

The building in Buenos Aires is accelerating. Newly released figures show that during the first eight months of this year, 53% more construction (measured in area) was approvel than in the same period last year. During the eight months, 5,557 building permits were issued for 2.3 million sq meters of construction, compared with 5,175 permits last year for 1.5 million sq meters. In 1955, permits were issued for 1.4 million sq meters.

Argentine Mountain Road Approaches Completion

A 9.5 mile stretch of mountain highway, almost every yard of it blasted out of solid rock, will be finished early next spring to provide a direct road between the Argentine cities of Cordoba and San Juan.

Work on the highway—which has an over-all length of 301 miles—started several years ago, but construction difficulties in carrying the road through Argentina's western Andes foothills have held up completion.

The final 9.5 mile stretch, through the Pocho Mountains (some 6,600 ft above sea level) will have taken two years to build and cost about $1.7 million. The new road will have an average gradient of 6.5%, with curves of a minimum radius of about 40 yd, to permit passage of all vehicles, including heavy trucks. Five reinforced concrete tunnels are included in the stretch now under construction.

Japan Plans Program For Aviation Improvements

A program to expand Japan's civil aviation facilities will be pushed hard in 1958, according to the Transportation Ministry's Aviation Bureau.

Key unit in the program will be expansion and reconstruction of Itami Airport, now occupied by U. S. forces, but scheduled to be returned to Japanese control by the end of March, 1958. A four year improvement program on this field will include construction of a new 10,000 ft runway. Other airport expansion is slated for Wakkanai, Hokkaido; Takematsu, Shikoku; Omura, Nagasacki; Kumamoto and Kogoshima.

Standard Oil To Build $40 Million Refinery

A $40 million refinery will be built in Hawaii by Standard Oil Co. of California after almost three years of con-

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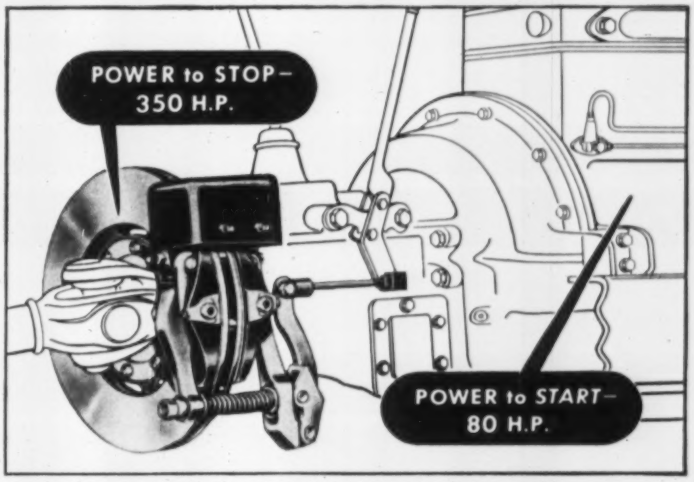
Meet Every Heavy-Duty Safety Requirement

OFFER POSITIVE PROTECTION AGAINST RUNAWAY OR PARKING ACCIDENTS—AT LOWEST COST

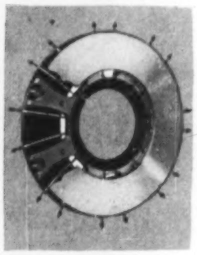
HERE IS WHY:

They have surplus power required for emergency service—no dangerous self-energizing

TRU-STOP Heavy-Duty Emergency Brakes are not only excellent parking brakes. They serve as a complete, independent and fully reliable braking system. Operating on the propeller shaft they enable the driver to continue on safely in the event of service brake failure. TRU-STOP brakes have the surplus braking capacity to be used *repeatedly* as an auxiliary to service brakes.

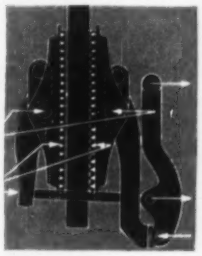


Brakes actually do more work than the engine in terms of horsepower Where it takes 80 HP to accelerate to 20 miles per hour, it takes 350 HP to make a safe stop from 20 miles per hour within required limits



Ventilated to throw off heat

Brake efficiency depends on ability to throw off intense heat—rapidly. Discs of TRU-STOP brakes are exposed to the air even during the braking operation. Ventilated design circulates air *between* the disc plates.



Give uniform brake pressure

Disc of TRU-STOP brakes is "squeezed" between the flat surface of the shoes. Effort applied to brake lever operates front and rear lever arms simultaneously. Pressure is exerted on the center of each shoe. Entire lining surface is in contact.

FOR SAFE, ECONOMICAL, HEAVY-DUTY BRAKING WITH MAXIMUM LIFE AND MINIMUM MAINTENANCE

TRU-STOP Brakes are used on a great variety of mobile and stationary equipment

SUCH AS—

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- Dump trucks
- Power dividers
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- Oil well pumps
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- Scrubbing machines
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We will be glad to answer any questions or give you more detailed information about TRU-STOP Heavy Duty Emergency Brakes. Send for
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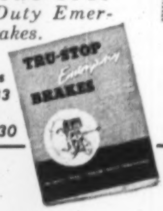

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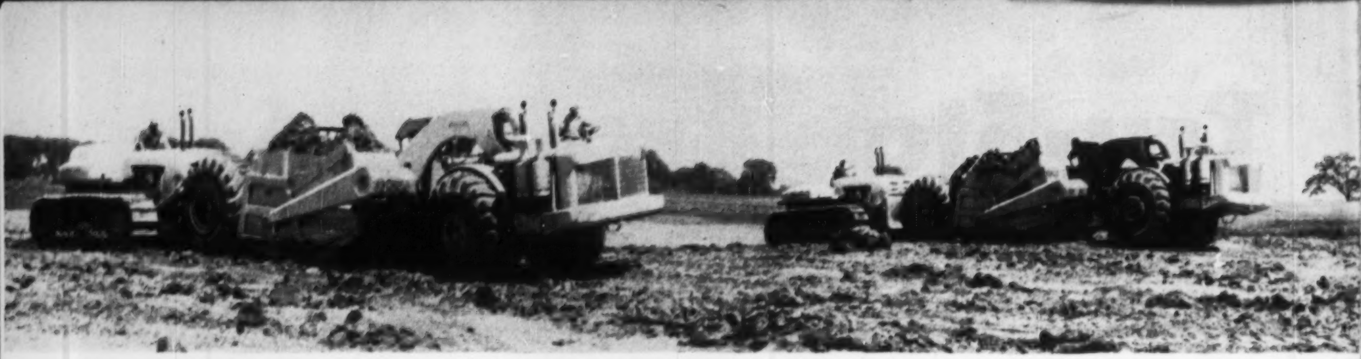

On the ILLINOIS TOLL ROAD...

"Eucs" outnumber* rubber tired

Euclid "Twin" Scrapers—42 of them—are proving that they move the cheapest dirt on all lengths of haul and under every job condition.

"Euc" Loaders and Bottom-Dumps are being used by several contractors on the Illinois Toll Road—they're a "natural" where big yardage must be moved in a hurry.

With a heaped capacity of 32 yds. and a total of 518 h.p., the TS-24 Euclid "Twin" outproduces any other scraper—moves more yardage at lower cost and gets more work done faster.

SUCCESSFUL BIDDERS FIGURE ON "EUCS"

Over 200 Euclid Scrapers, Bottom-Dumps and Rear-Dumps . . . plus 16 big TC-12 "Twin" Crawlers . . . are already on this "Road Show".

all competitive equipment combined

THERE'S keen competition among contractors for highway work — that's why you'll find Euclid earthmovers the outstanding equipment choice on jobs like the Illinois Toll Road. With their low cost, high production performance, "Eucs" provide a bidding advantage as well as protection for the contractor's profit margin. In spite of delays by weather and tough working conditions, over 225 "Eucs"— scrapers, bottom-dumps, rear-dumps and crawlers—are piling up yardage to help get the earthmoving done on schedule.

The performance of Euclid equipment on the Illinois Toll Road, as on most other major earthmoving projects in the last 20 years, is one of the many reasons why owners say from experience ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

These contractors*—big and small —are using "Eucs" to make the dirt fly on the Illinois Toll Road:

Arcole Midwest Corporation
L. G. Arnold & Griffith & Sons
Carl Bolander & Sons
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L. F. Fleming Co.
S. J. Groves & Sons Co.
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Western Contracting Corp.
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*As of August 1, 1957

EUCLID

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM MORE POWER FOR YOU

Practical lay-away plan for storing gas

...in NATIONAL SEAMLESS STEEL BOTTLES

Buried underground in National Seamless Steel Bottles . . . that's the method practical utility companies are now using to store their natural gas. Buried underground . . . out of harm's way; safe from storms, high winds and lightning . . . where there are no hazards to or from aviation.

And once they are in the ground, Seamless Steel Bottles require minimum maintenance: no periodic painting needed, fewer inspections necessary. And there is no danger from vibration or settling, as in surface installations.

Because underground temperatures are more stable, there is usually less, and sometimes *no* fluctuation of gas pressures. However, when minor repairs or inspections are in order, any group or string of bottles can be taken off the line without affecting the gas pressure of the remaining groups of bottles.

Fifty Seamless Steel Bottles—averaging 39′ in length x 24″ in diameter—will hold 1.4 *million* cubic feet of natural gas at 2400 psi.

National Seamless Steel Bottles are pierced from solid billets of the highest-quality steel. Before shipment every one is inspected and subjected to severe high-pressure hydrostatic tests. You are thus assured of safe walls and efficient performance throughout long years of service.

The underground storage technique deserves your careful consideration. You can get detailed information on National Seamless Steel Bottles by writing to: National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

WALLS WITHOUT WELDS

NATIONAL SEAMLESS STEEL BOTTLES

UNITED STATES STEEL

troversy over a site. The original Sand Island location, at the entrance to the Honolulu Harbor, has been abandoned and a new one chosen at Ewa, some 15 miles from Honolulu. The new site was selected because further delay on approval of Sand Island was anticipated.

The plant will cost $10 million more than first planned and will be larger than originally anticipated, having a capacity of 35,000 barrels a day. It will be located near one of its major customers—the Pearl Harbor naval base—and on 310 acres to be acquired from the estate of James Campbell, one of Hawaii's largest private landholders.

The refinery will be the cornerstone of a proposed new community and will occupy 20% of the new community's industrial zone. One feature of the facility will be a pipeline extending 10,000 ft out from the shore to a depth of 60 ft, to accommodate vessels of any size.

Construction is expected to begin early next year.

$3 Million Contract Signed for Airport in Afghanistan

A contract for more than $3 million for construction of an international airport in Aghanistan has been formally awarded to Morrison-Knudsen International Constructors.

The contract was signed by the president of the Afghan Air Authority and by the International Cooperation Administration, as well as the contractor. Total cost of the airport, to be built at Kandahar in the southern part of the country, is expected to total about $8 million, about half of which has been provided to the Afghan Government by ICA.

Argentine Seeks Bids On a 450 Mile Canal

The Argentine government has asked for bids on construction of a 450 mile canal that would run parallel to the Bermejo River to connect the Oran oil fields, in the state of Salta, with the Parana River port of Barranqueras, in the Chaco.

The project is expected to cost about $222 million. Bids will be received until Dec. 30.

The project has long been advocated in Argentine as a means of opening up the isolated north part of the country. The major problem at the moment in this area is the oil fields owned by the national oil entity Yacimientos Petroliferos Fiscales (YPF), which reportedly has had to cap many wells in the Salta fields because of lack of transportation to the refineries. In addition,

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QUAKER RUBBER DIVISION

the canal is expected to provide a navigable waterway to the sea for Argentina's neighbor, Bolivia. The canal will connect with Bolivia's rail system. Part of the project will be construction of a 4,000 square kilometer artificial lake near Oran to control canal depth, and locks and lock-gates to regulate water in the canal.

The invitation calls for two separate bids: one for construction and financing of the canal and its complementary works, and one for technical studies, inspection, certification of the project.

The comision Nacional del Rio Bermejo, Av. Pte. Roque Saenz Pena 501, Buenos Aires, is the agency that will handle the bidding.

Brazil Plans to Push Highway Paving Work

Mindful of the fact that Brazil is lagging far behind other Latin American countries in highway paving, the national government has scheduled paving of more than 8,600 miles of roads in the next three years.

In 1955, Brazil had only 1,600 miles of paved roads, compared to Mexico's 16,000 and Argentina's 6,800 mi.

According to the National Highway Department, one of Brazil's principal problems so far has been finding a plentiful source of bituminous binder. The lack of this material now has been filled by using a type of tar produced as a by-product from the huge Volta Redonda steel mill and by the national Petroleum organization that now is processing asphalt.

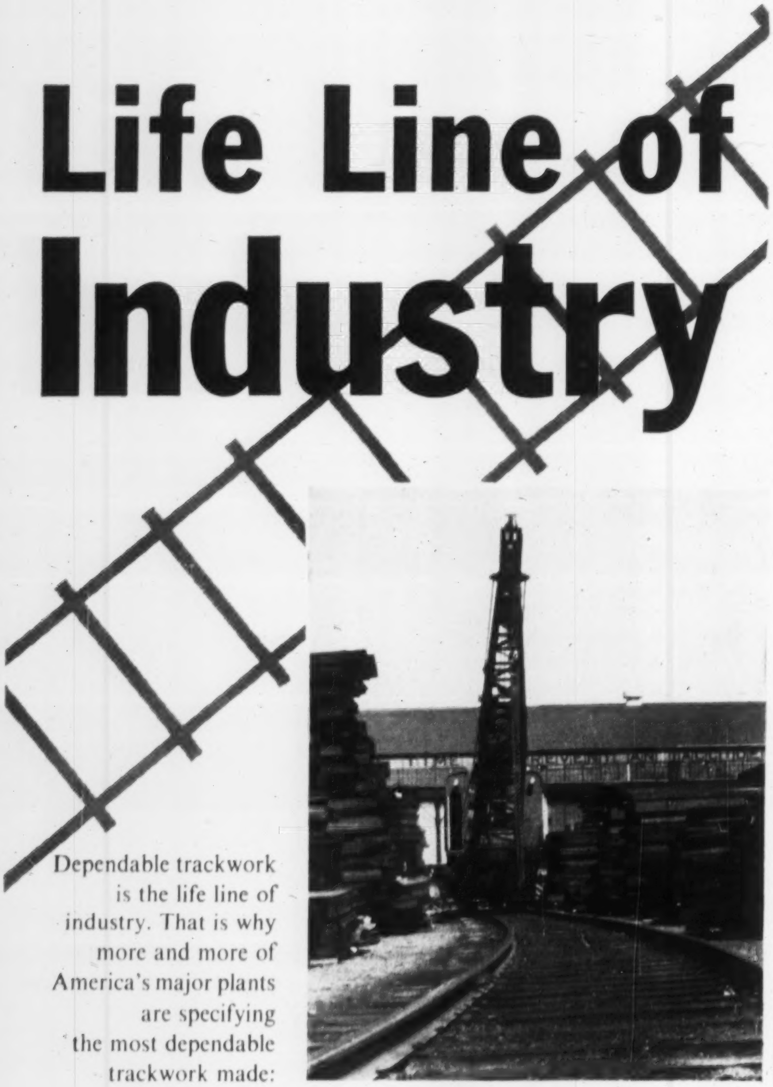
Iran Is Planning Big Dam That Can Be Made Bigger

Iran plans to build a 460 ft high gravity arch dam on the Dez River about 150 miles north of the Persian Gulf. The project, a multipurpose one, is estimated to cost $59-million and would be the first in a series of river control structures in the area.

Power capacity at the dam will be 160,000 kw, but the dam is to be so designed that it later could be increased another 160 ft, its capacity jumped to 520,000 kw.

The dam, which will also feature flood control and irrigation, will be built in a deep mountain canyon at a point where it is about 490 ft wide. Preliminary work is being done by Development and Resources Corp. of New York City, a private company headed by David E. Lilienthal and Gordon R. Clapp, both former Tennessee Valley Authority chairmen.

Bidding on the dam contracts will be international.



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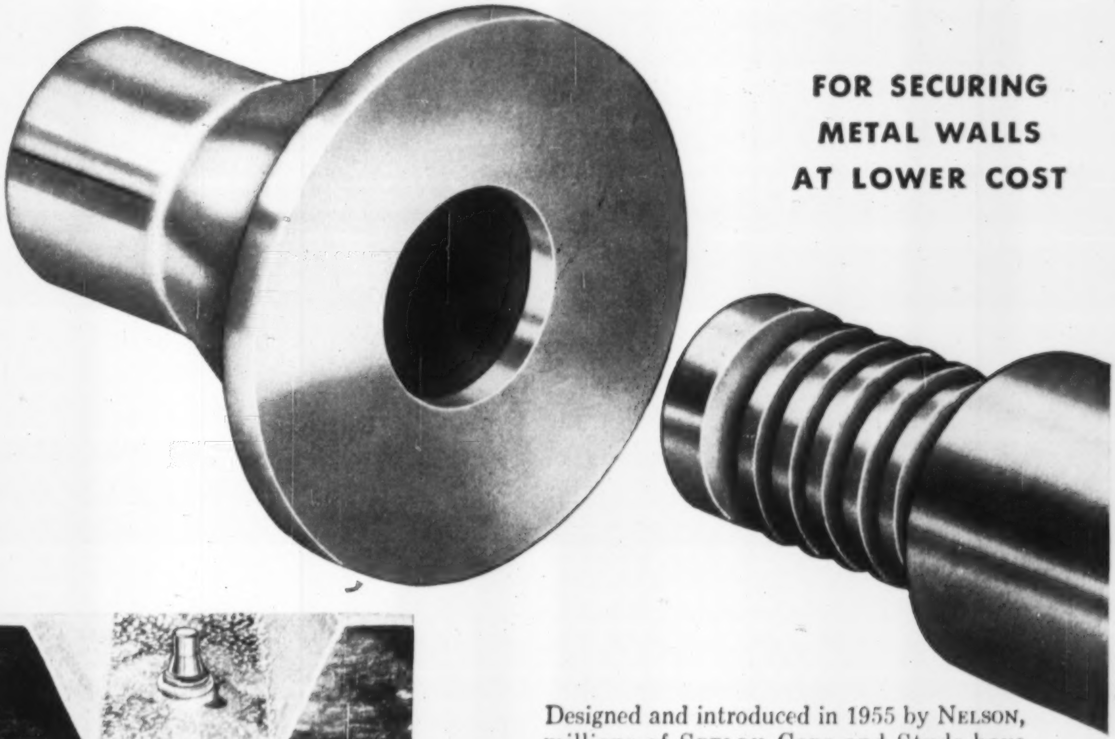

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The Quality Verification Program conducted by "the man in the white coat" is a continuing program of checking and inspection of member-company joist manufacturing processes and materials. This program is administered for the SJI by a nationally known testing laboratory. In the photo above, the inspector is measuring accuracy of fabrication at several points along the length of a Truscon "O-T" Steel Joist, Short-Span Series.

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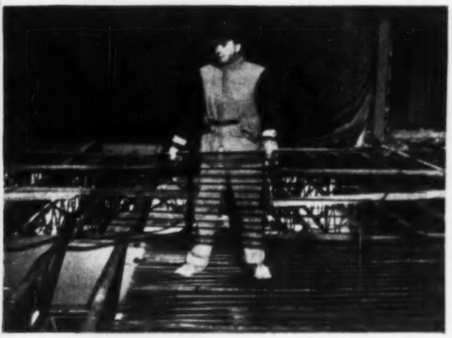

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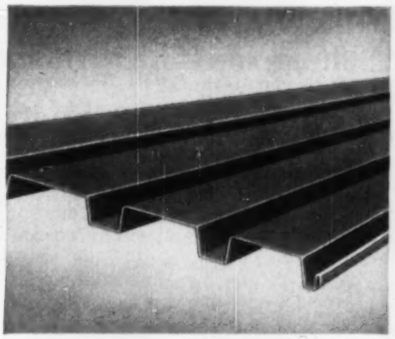

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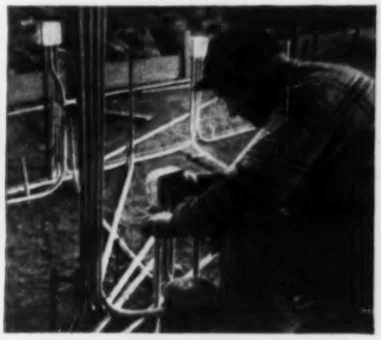

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COMMENT
from the
BUTLER ENGINEER

. . . of a New Paving Record and the Airflomatic

News: a paving contractor in Michigan laid almost a mile of pavement 24 feet wide, 9 inches thick in 9 hours. Had the new Butler TX4 Roadbuilders Plant feeding 3 dual drum pavers . . . And now, having hung up this record, he can't wait to add a fourth paver. When Butler reigns it really pours!

Best production we'd heard of was a contractor who did 4,368 feet of pavement 24 feet wide and 10 inches thick in a 16-hour day. When the Michigan contractor adds that fourth paver (which the Butler TX4 can easily accommodate) we'll have more hot news for your eager eyes.

By the way — *only one operator handled the batching.*

There's a Central Mix Plant in Iowa which we bid on some years back. One of the johnny-come-lately manufacturers bid just a hair or two lower. Plant was built — expensive concrete bulkheads and automatic controls. It never worked a full day; valves, cylinders — something critical forever breaking down! Owner finally sold it to a competitor (who had a Butler Plant). He called in the Butler Engineer. It cost over $6000 to make the corrections. Moral? Well, write your own.

The new Butler Airflomatic Cement Feeder's a sensational success. Standard now on the TX4 Roadbuilders and Butler Ready Mix Plants. Cement flows on a cushion of air. No moving parts; no drives or bolts to shear. Replaces troublesome vane-feeders. Can be installed on any plant regardless of make. Why not write for all the dope?

The Butler Engineer

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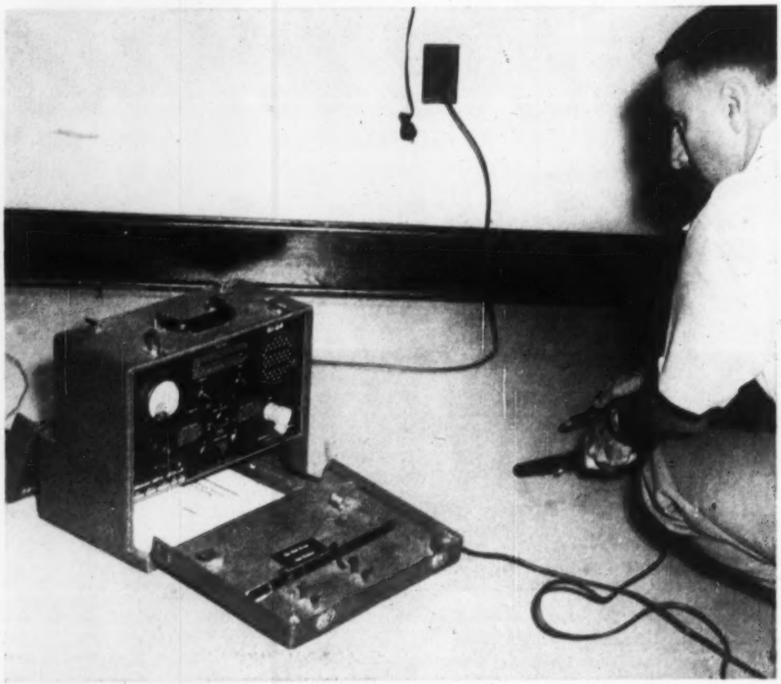
Field and Office



Shifting successfully from surgical to structural use . . .

Shrapnel Finder Spots Embedded Steel

Several districts of the Corps of Engineers are now using a medical-surgical steel-detecting device for locating embedded steel bars in reinforced concrete.

Adapted first by the Washington, D. C., District of the Corps, the tool is an electronic shrapnel finder, called the Berman metal locator, used during World War II to guide surgeons in removing metal fragments from persons injured in bomb or artillery-shell bursts. Slightly modified for its new application, the apparatus locates steel as much as 5 or 6 in. below the concrete surface and is able to fix the depth of each bar if the spacing is 5 in. or more.

• How it is used—In using the locator, the operator passes the tip of a hand-held probe over the surface being investigated. Both an audible signal and a scaled dial incorporated in the instrument indicate the proximity of steel. When the probe is directly over the steel, sound pitch reaches a peak and the dial reads a maximum. Marking the location, the operator then moves the probe along the surface to a point where the dial registers only three-eighths of the maximum. The distance between the two points is equal to the depth of concrete cover.

Beginners reportedly can get accurate results with the instrument after only 20 minutes of instruction. But an experienced operator gets more information—and in less time.

• Extensive use—Washington District engineers have used the locator in a number of investigations. On one job it was found that dowels in a spandrel wall did not penetrate the roof-slab edge-frame concrete as they should. On another project, where wall forms had bulged during concrete placement, the engineers measured the depth to reinforcing steel and thus determined how much bulged concrete they could safely chip off.

Informed by the Office of the Chief of Engineers of the Washington District's new development, other districts and divisions now have purchased locators from the manufacturer, Berman Laboratories, 112-03 Rockaway Blvd., Ozone Park 20, N. Y. One of the metal finders is being used in the Ohio River Division's rigid-pavement laboratory.

• Limitations—The locator is not uni-

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With overhung engine type tractors and full 90° hydraulic steering, these two new Euclid Rear-Dumps have excellent maneuverability for close quarter work and accurate spotting at loading and dumping areas. Big tires provide extra traction and flotation for soft fills and difficult hauls. The low over-all loading heights and rugged construction permit easy loading with all types of equipment. Smooth bodies with 3-stage, double-acting Euclid hoists assure quick shedding of loads.

Downtime and maintenance costs are held to a minimum as a result of the easy service accessibility of all major components. Interchangeability of the semi-trailer rear dump bodies with 7 and 18 yard scraper bowls provides extra flexibility for changing job requirements.

Your Euclid Dealer has detailed information on these versatile "Eucs" as well as other Rear and Bottom-Dump models, Scrapers and Crawler Tractors ... have him show you why ***Euclids are your best investment.***

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143 h.p. ...
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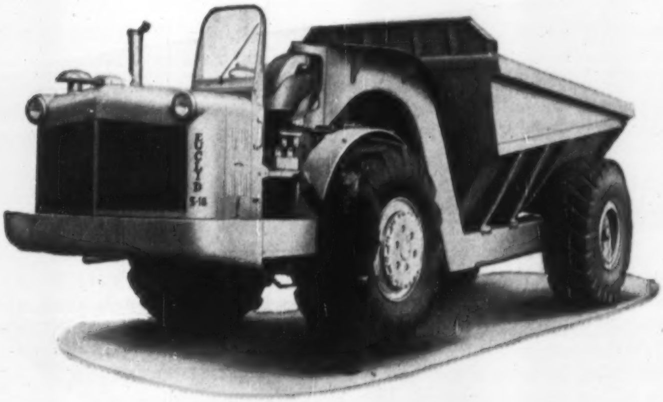
Torqmatic Drive.



AND THE S-18 REAR-DUMP

35 tons payload ...
32 cu. yds heaped ...
300 h.p. ... 27.00 x 33 tires
Torqmatic Drive.

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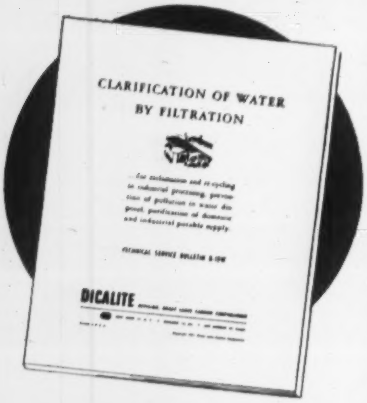

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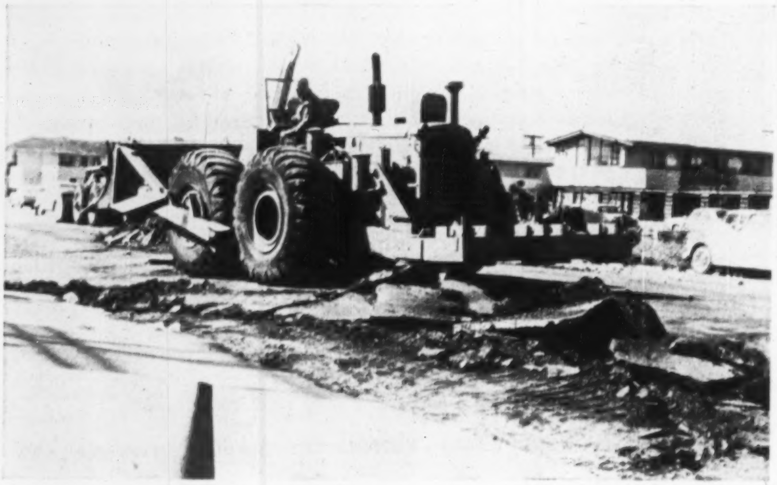
versally applicable. In less densely reinforced elements—slabs and walls, for example—the apparatus is said to track down the location to a gnat's whisker. But where bars and rods are closely grouped—as in heavy wall-bearing columns and long-span girders—side interference from nearby steel distorts the effectiveness of the detector in spotting the precise location and depth of cover for each piece.

For practical purposes, the apparatus cannot definitely locate steel bars spaced closer than 5 in. Nor can it measure the thickness of the embedded steel. About the best a skilled operator can do is detect the difference between, say, a ¼ in. rod and a 1 in. bar. Another limitation is that a deeply embedded large bar may give the same reaction as a small one near the surface. Extraneous fragments, too, can upset the readings. In the first application of the equipment by the Washington District, results were confused and meaningless. The engineers soon discovered that the asphalt tile covering the concrete surface under investigation had been cleaned with wire brushes or steel wool, leaving tiny bits of steel lodged in the tile joints.

For these reasons, structural drawings are essential for determining steel sizes accurately, according to W. Marks Jailite, assistant chief of the military branch, and ace equipment operator Angelo Ferrara, of the Washington District. District engineer in Washington during the adaption of the metal locator for structural use was Col. Ray Adams, since succeeded by Col. George B. Sumner.



Dozer, Tractor, Ripper on Single Machine

With the job of maintaining 4,800 miles of streets in the sprawling 450 sq mi area bounded by the city limits of Los Angeles, the city's Department of Public Works places top emphasis on equipment mobility.

To get time and manpower saving qualities the department will go to considerable lengths—even to building special equipment to suit its needs.

An example of this is a machine purchased for the job of rebuilding a number of boulevards throughout the city. What was needed was a heavy-duty tractor, with bulldozer and a big ripper to tear up old surfacing. The department wanted all this in a single unit—one that also could move freely from job to job over city streets under its own power.

Making a study of available equipment, engineers found that no manufacturer built a tractor that offered all of the features and qualities desired.

The machine that most nearly met specifications was the LeTourneau-Westinghouse Model C Tournatractor, but this firm offered no integral mounted ripper. Department officials contacted Crook Co. in Los Angeles. After the problem was explained, Crook agreed to manufacture the ripper and install it on the Tournatractor. The unit was delivered in 1954.

Today, with more than three years of steady work behind it, the machine reportedly is functioning perfectly. According to supervisors at the City Equipment Yards, it has so much power that "the ripper slices through a macadam street like a hot knife through butter." Attesting to usage it has had and the tough work done, they report that the rig already has worn out six shanks and more than 100 teeth.

(Field and Office continued on page 87)

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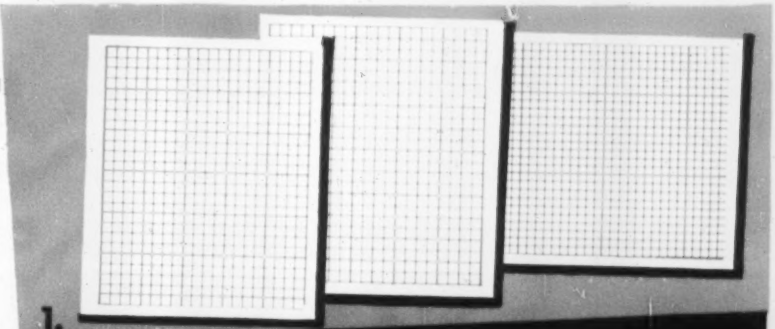
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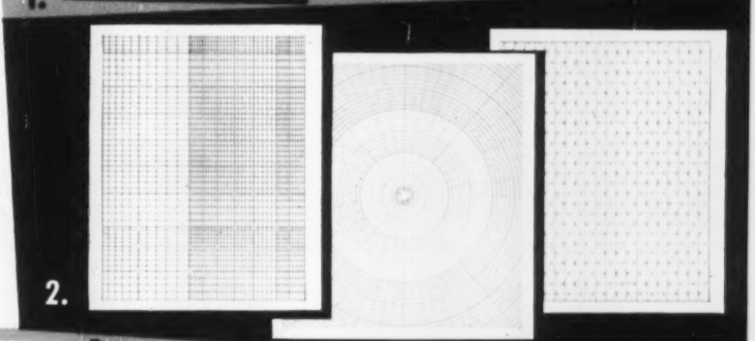
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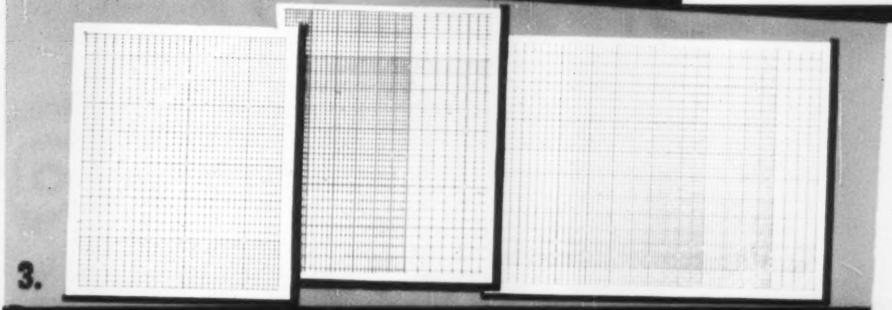
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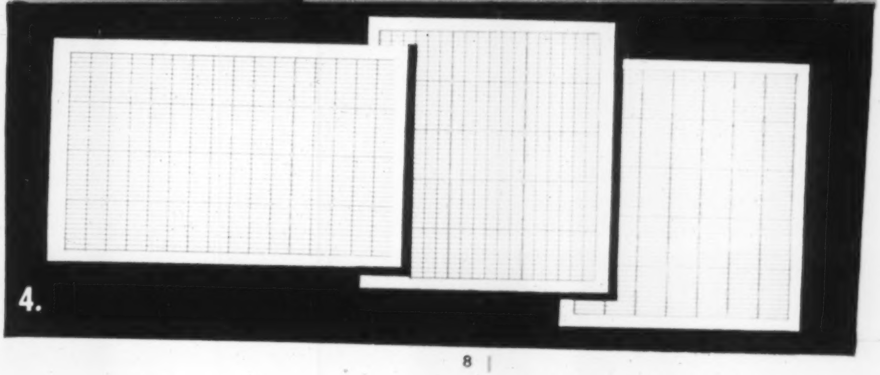
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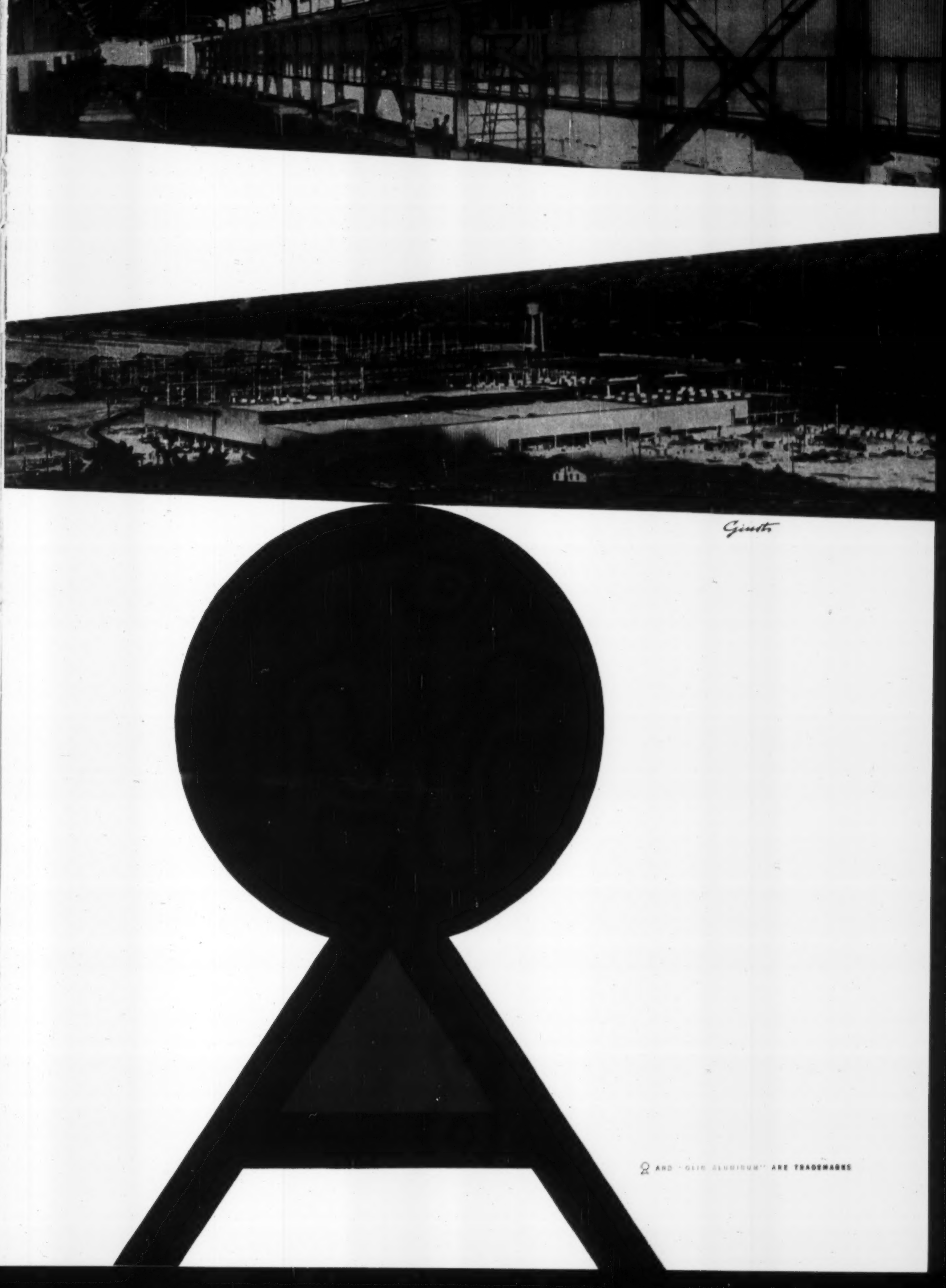
Flag-raising day at this giant new mill will mark an important new chapter in the exciting 22-month growth of Olin Aluminum. New ore ships, rolling mills, extrusion plants and wire and cable mills are already in operation or under construction. With these modern, fully-integrated facilities, Olin Aluminum is right now on the way to an initial annual volume of 340 million pounds of quality Aluminum. And that is only the beginning.

This new Aluminum will be custom-tailored to your specifications. And the unique standards of quality and service by which it will be produced and delivered to you will help you simplify your manufacturing procedures and achieve maximum efficient production from each pound you use.

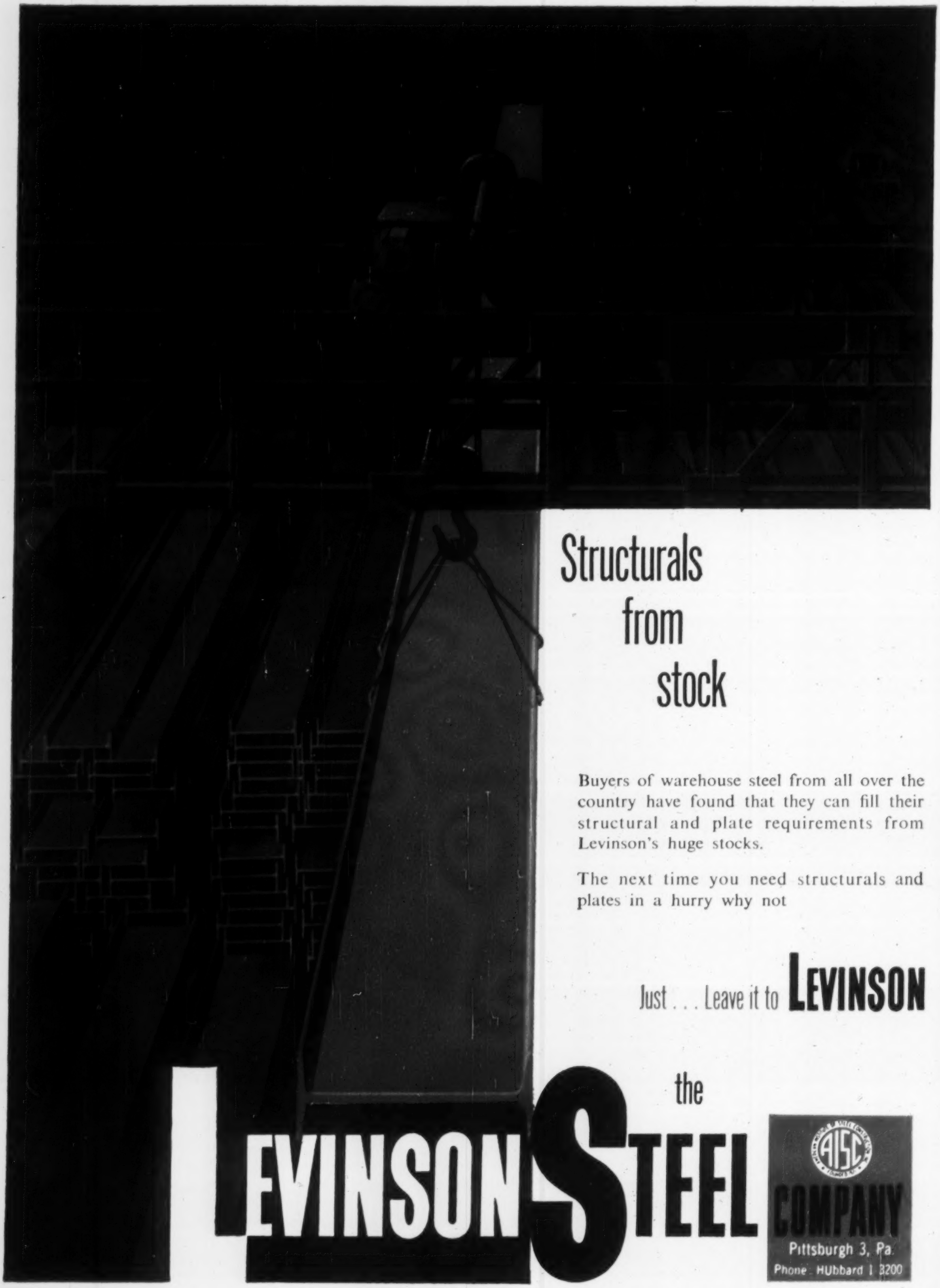
If this is the kind of quality and service you have long been looking for, write now for product availabilities to our new permanent sales headquarters: Aluminum Division—Sales, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, New York.

OLIN ALUMINUM

*Symbol of new Standards of Quality and Service in **the Aluminum** Industry*



AND "OLIN ALUMINUM" ARE TRADEMARKS



Structurals
from
stock

Buyers of warehouse steel from all over the country have found that they can fill their structural and plate requirements from Levinson's huge stocks.

The next time you need structurals and plates in a hurry why not

Just . . . Leave it to **LEVINSON**

the
LEVINSON STEEL COMPANY
Pittsburgh 3, Pa.
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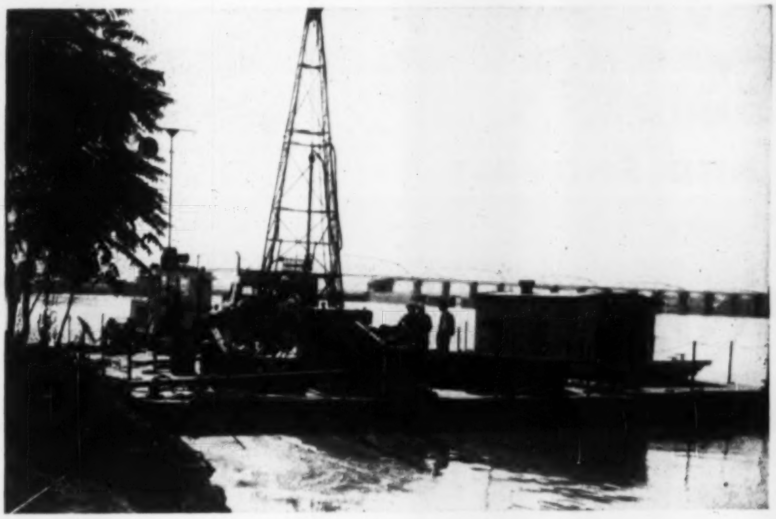


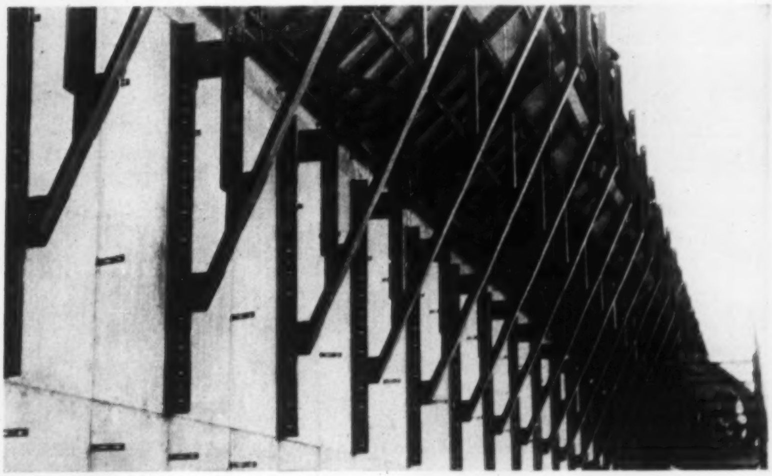
Two barges and a truck-mounted drill make . . .

An Improvised Overwater Boring Rig

Making optimum use of available basic equipment and a minimum of specialized fabrications, an overwater boring apparatus for taking core samples has been put together by the St. Louis District, Corps of Engineers.

Two pontoon flats, each 46 x 16 x 3 ft, have been welded together, leaving a space between. A rotary type core drill mounted on a truck is positioned over the opening. The boring shaft extends through a pipe casing that goes from the top of the barge to a point near the bottom of the river. The barge outfit is held in place by anchors.

The rig is being used to make studies of the riverbottom for a new 1,200 ft lock proposed to replace the present auxiliary lock at Lock and Dam 26, Alton, Ill. Depth of water goes from 6 to 60 ft, and depth to the rock being investigated is from 50 to 120 ft.



Y-Wall Forming Goes Fast

Wander & Mason, general contractors on additions to a sewage treatment work in Columbus, Ohio, are using a speedy Y-wall forming system. Brackets designed by Irvington Form & Tank Corp., New York City, are combined with standard Atlas Compo form panels to speed erection and reduce labor and handling costs. Brackets anchored to tie ends from previous pour utilize same key and wedge used for locking form panels together.

Rx
for
Wet Job
"Headaches"

Consult with Griffin's engineers.

Ground water analysis and pre-bid estimate —no obligation.

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UP TO 30" x 30"—60' long
ALSO A COMPLETE LINE OF TECO TOOLS & CONNECTORS
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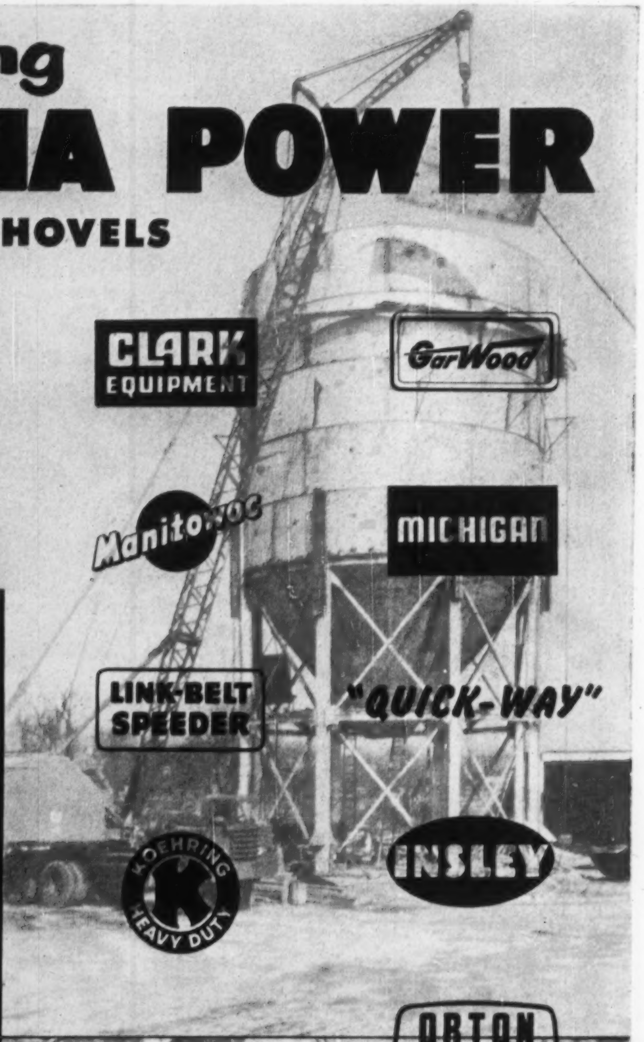
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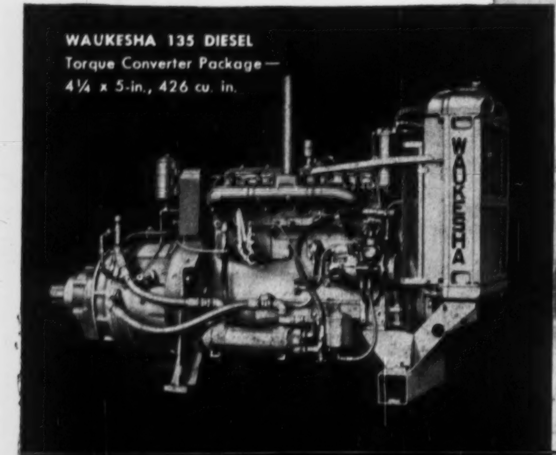
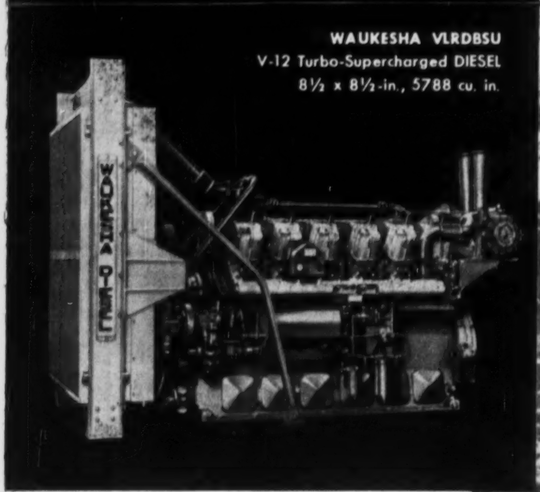


WAUKESHA 135 DIESEL
Torque Converter Package—
4¼ x 5-in., 426 cu. in.



WAUKESHA VLRDBSU
V-12 Turbo-Supercharged DIESEL
8½ x 8½-in., 5788 cu. in.

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ORTON Torque-Control
UNIT
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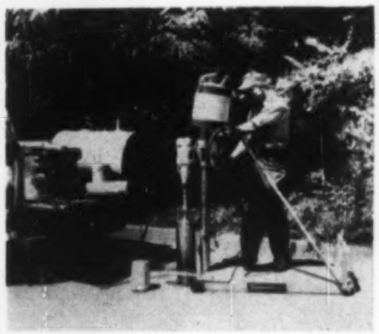
Complete size range to 1235 hp . . . all standard fuels.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
New York • Tulsa • Los Angeles



Test Core Drill Ready For Highway Testing

Removing test cores from a concrete highway is said to be quick and easy with the electric Pendrill.

The drill can be operated by one man, to drill holes from ½ to 6½ in. diameter through concrete, marble, granite tile, glass and brick. Said to be light and portable, quiet and dustless, it is adaptable for drilling vertically, horizontally or at any angle. It operates on AC or DC current. KOHLER CO., KOHLER, WIS.

Heavy Duty Bar Benders Take Up Little Space

Two heavy duty benders have been developed by Monarch Forge. The Model 25 heavy duty square bender is a flush cable type, which will make bends in reinforcing steel up to 2½ in. in diameter.

It is operated by a 20 hp motor, weighs 7,400 lb, and takes up a space of 6 ft x 6½ ft. Table is at 30 in. height.

The Model S stirrup bender was developed for heavy duty stirrup bending. It will make any kind of bend, except radial bends, in reinforcing steel of any size up to No. 9 bar—about 1⅛ in. in diameter. It is powered by a 5 hp electric motor and drives through a gear reducer. It occupies a space 36 in. x 52 in. with a table 30 in. high. MONARCH FORGE & MACHINE WORKS, INC., 2130 N. W. YORK ST., PORTLAND, ORE.

Boron-Alloy Sprockets Used on Cat D8's and D9's

An innovation in modern metallurgy is said to be the use of the element boron to increase the life of crawler tractor sprockets, now being offered as standard equipment on Caterpillar D8 and D9 tractors.

Marketed under the trade name of Boralloy, these sprockets are said to measurably increase the life of the sprocket and, according to the manufacturer, are the first commercially successful attempt to produce boron bearing cast carbon steel by the acid open hearth process.

The Boralloy sprocket was developed as a cooperative research project between Caterpillar and Harrison Steel Castings Co. of Attica, Ind.

Caterpillar engineers say that tests on the first boron steel manufactured in December of 1955 indicated a hardness depth two and one-half times greater than that of straight carbon steel of the same chemistry.

Tests also were made at the Caterpillar Metallurgical Laboratory in Peoria to confirm these results.

Boralloy replacement rims are now available for D8 sprockets. CATERPILLAR TRACTOR CO., PEORIA, ILL.

New Power Steering Unit Goes on Any Motor Grader

A new product of Precision Controls Co.—the Gyde-Master Power Steering Unit—is said to mount on the steering shaft of a vehicle and provide steering control by applying torque to the shaft.

According to the manufacturer, the unit performs all functions of any power steering device, provides effortless turning for the operator, holds the vehicle on its course, absorbs road shocks and allows more time for manipulation of implements. The device is said to be usable on connection into and operation by the vehicle's hydraulic system; thus mechanical steering is preserved so that steering can be continued in the event of a hydraulic power failure. PRECISION CONTROLS CO., 5038 CHOWEN AVE. SOUTH, MINNEAPOLIS 10, MINN.

MOTO LOADER

New Front End Loader Enters Field

The Thew Shovel Co. has announced the entry of a new rubber-tired front-end loader into this active machinery field.

Named the Moto-Loader, the first model is a four-wheel drive, 1¾ yd capacity unit. Available with either gasoline or diesel power, the machine has a torque converter transmission, has a top speed of 21 mph, and is provided with planetary axles on both front and rear.

A special feature claimed for the machine is the use of two adjacent foot pedals—one for forward travel and one for reverse to give the operator instant direction control with one foot while the other foot is used for braking. This frees both hands for steering, hoist and bucket controls and contributes to ease of operation and precise control.

Also placed under the forward and reverse foot pedals are additional accelerators to provide travel speed control in either direction without removing the foot from the shifting pedals. These accelerators may be used at the option of the operator, since there is a conventional foot accelerator in the normal position. The machine, with gasoline power, weighs 18,900 lb. With diesel engine it weighs 19,600 lb. THEW SHOVEL CO., LORAIN, OHIO.

(New Products continued on page 90)

Kinnear Rolling Doors

Kinnear originated the upward-acting door with the curtain of interlocking steel slats. For more than half a century, Kinnear has built doors exclusively—your assurance of highest quality. Write for Kinnear catalog!

KINNEAR ROLLING DOORS
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Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service.

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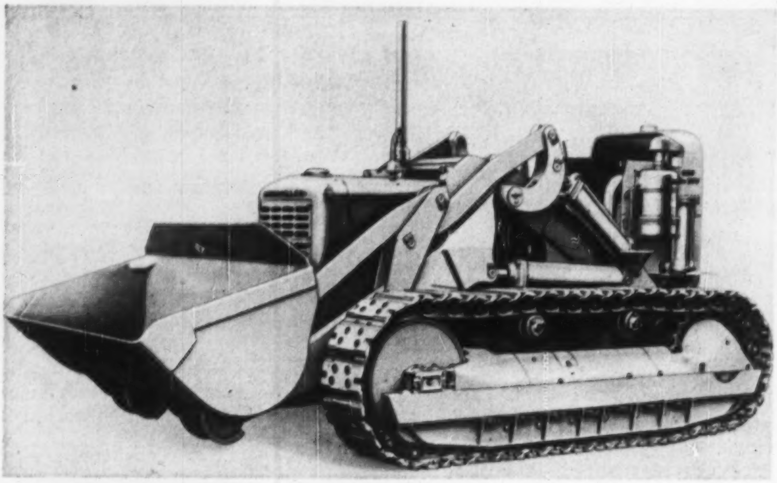
MADESCO BLOCKS

MADESCO TACKLE BLOCK CO.
EASTON, PA.

Engineered to Serve
Your Special Service Needs

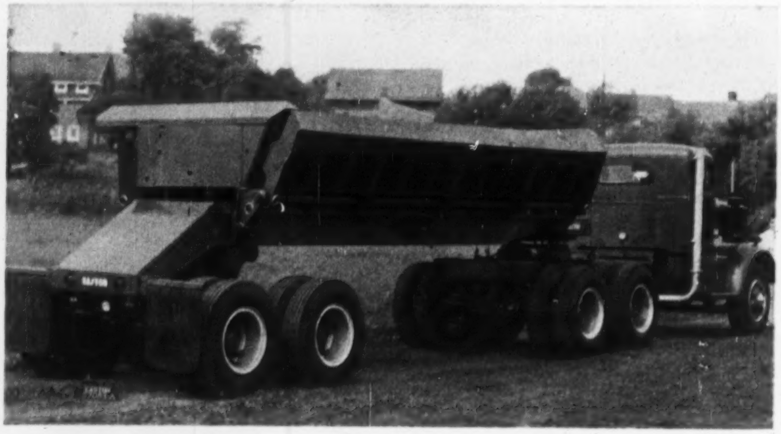


Cat Makes Additions to Traxcavator Line

Two new Traxcavators, said to be designed especially for severe applications, have been announced. Known as Caterpillar No. 955 and No. 977 (Series E), the machines have been given design modifications from their corresponding Series C Models, with the particular aim of meeting especially rugged conditions imposed by such jobs as quarry work.

Prime features of both new machines, according to the manufacturer, include a strong undercarriage with heavy construction incorporated into all parts, track roller frames, sprockets and front idlers.

Besides imparting extra machine sturdiness, these features also are said to allow for high ground clearance of the units, and at the same time, a low center of gravity. CATERPILLAR TRACTOR CO., PEORIA, ILL.



Heavy Hauler Adapted for On-Highway Work

A standard off-highway, drop-door, side-dump trailer has been adapted to meet state highway regulations yet carry a maximum payload.

The new Easton TD-1115 trailer was designed originally for a cement producer who had to haul blasted rock from a new source to an established plant after the quarry adjoining the plant had been worked out. By meeting state highway specifications, the trailers can haul maximum payloads from shovels over seven miles of highway to the hopper feeder and primary crusher. The trailers are hauling 15 ton payloads.

According to the manufacturer, Easton engineers have used special alloy steels and a tandem trailer suspension. Lights, directional signals and splash guards have been installed to meet

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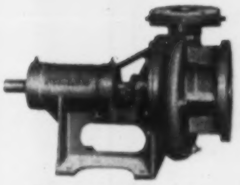
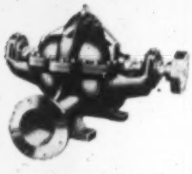
TIME \ MONEY \ ENERGY

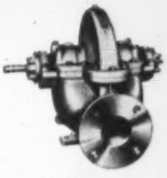
TYPE PE FLUIDYNE INTEGRAL HP PUMPS
A complete line of electric close-coupled general purpose pumps. Threaded or flanged connections. Capacities: to 800 gpm; heads: up to 260 feet; motors: up to 50 h.p.



TYPE PB FLUIDYNE GENERAL PURPOSE PUMPS
Flexible coupled, single-stage, end suction, general purpose pumps. Rugged and durable. Capacities: up to 5500 gpm; heads: up to 260 feet; motor: up to 150 h.p.



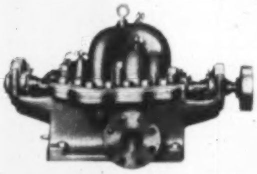
TYPE A GENERAL PURPOSE PUMPS
For application to the widest variety of pumping conditions. Single stage split case design. Capacities: up to 70,000 gpm; heads: to 300 feet. All types of drive.



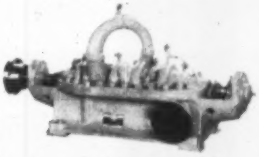
TYPE AS GENERAL PURPOSE PUMP
The centrifugal pump with mechanical shaft seals that eliminate the packing box. Up to 4" in discharge sizes. Capacities: up to 750 gpm; heads: up to 210 feet.

BY BUYING FROM THE COMPLETE LINE

VERTICAL DEEP WELL TURBINE PUMPS
For application to deep well pumping. Lifts from 1000 feet or more. Capacities: up to 30,000 gpm. H.P. range: up to 1000 h.p. oil and water lubricated types. Widest range of sizes.



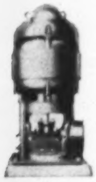
TYPE TU BOILER FEED AND PROCESS PUMP
2-stage high pressure pump for water and other liquids. Capacity: 50 to 3500 gpm; heads: up to 600 feet. Internal cross over is built into top half of pump case.



TYPE TUT MULTI-STAGE PUMPS
3, 4 and 5-stage pumps for water handling and process services. 1" to 5" discharge sizes. Capacity: up to 1350 gpm; head range: up to 1600 feet. Split case design.

INDUSTRIAL SERVICE PUMPS
For application to pits, sumps, basins, reservoirs and other surface water sources. Same capacity as deep well turbine above. H.P. range: up to 2500 h.p.

HYDRO-LINE PUMPS
An enclosed, close-coupled, vertical centrifugal process pump for handling petroleum hydrocarbons, where NPSH is limited. Capacities: to 6000 gpm; heads: to 1500 feet.



HI-LIFT PUMPS
The unique positive displacement deep well pump that literally squeezes water upward. Capacity: 10 to 55 gpm; lifts: up to 1000 feet. For wells 4" in diam. and up.

PEERLESS PUMPS

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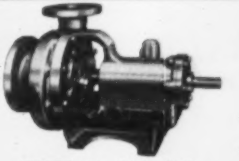

TYPES DL AND DM PROCESS PUMPS
Single stage, end-suction chemical process pumps with maximum interchangeability of components. Open or enclosed impellers. Packing gland or mechanical seal. Capacities to 800 gpm. Heads to 430 feet. Temperatures: to 450° F.

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Rugged, compact, portabe self-priming pumps manufactured to AGC specifications, seven models and types to choose from providing 4,000 to 30,000 gallons per hour.

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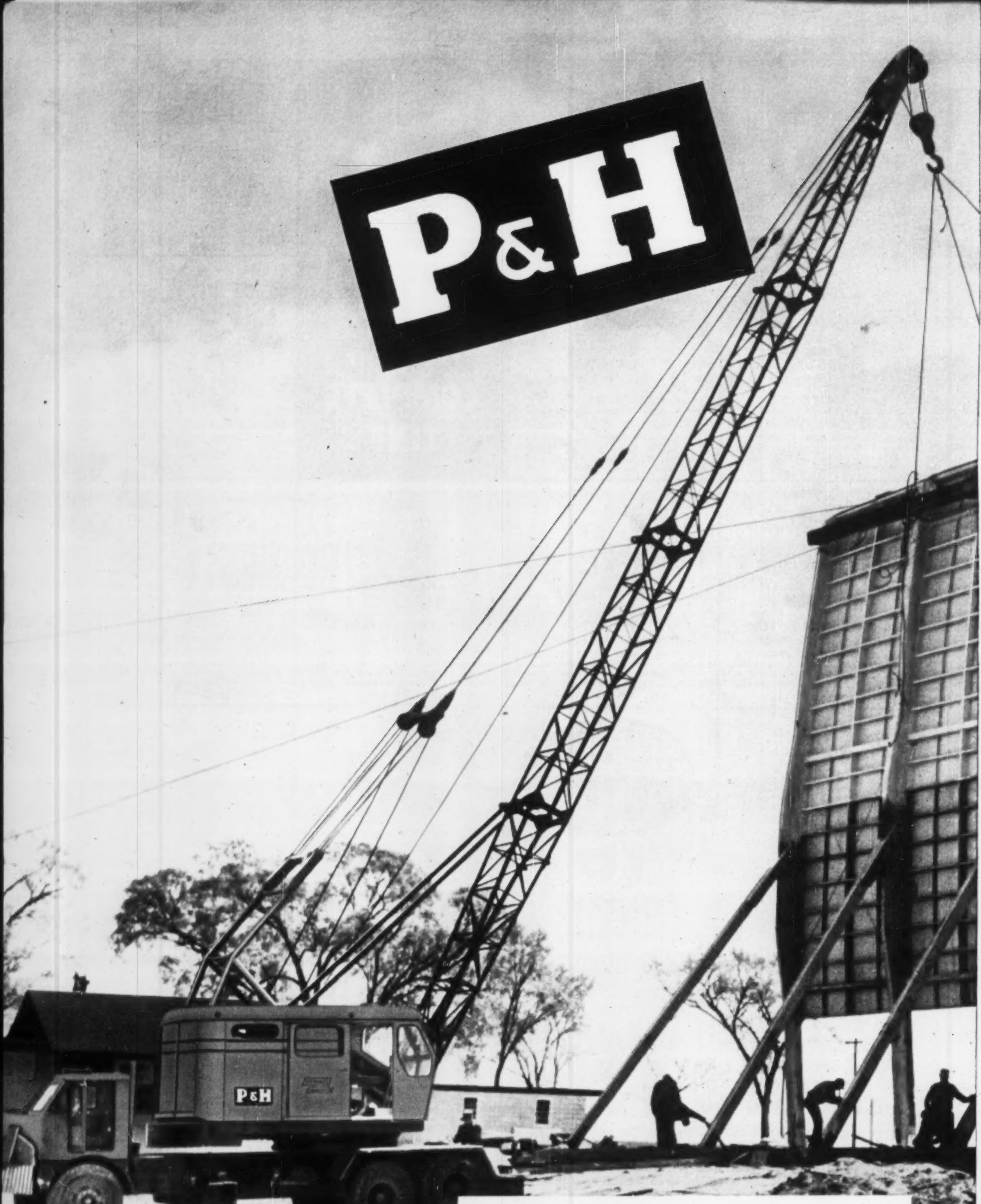


35-ton P&H 555A-TC shown erecting an outdoor movie screen in the Milwaukee area.

Get more "working days"

with the 35-ton P&H 555A-TC

In the 35-ton classification, there are more truck cranes with the familiar P&H trade mark than any other make—BY FAR!

An example of the P&H 555A-TC putting in more "working days" at a higher profit is the rig shown at left. Customers of John Hennes Trucking Co., Milwaukee, Wis., keep this 555A-TC constantly on the go . . . and it's always ready to go! It requires minimum maintenance. When replacements are needed, P&H parts service is prompt.

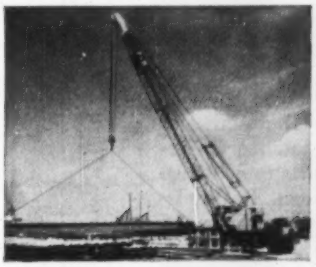
This profitable production is typical of P&H performance. It comes from such features as the P&H Planetary Boom Hoist. Lowering is always done under power and the boom can be safely held in any position. *The P&H Planetary Boom Hoist is a standard feature.*

Add to this exclusive feature the P&H alloy steel, open-throat booms that are lighter yet more rugged—the famed P&H all-welded construction—the superior live roller circle and you, too, will see why the P&H 555A-TC is the most popular truck crane in the 35-ton field.

Harnischfeger Corporation
Construction & Mining Division
Milwaukee 46, Wisconsin

THE P&H LINE **Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 40 tons**
Shovels: ½, ¾, 1½, 1¾, 2½ and 3½ yards

Across the country P&H machines lead the field in power, speed, flexibility and profitable performance



TEXAS

For handling loads up to 20 tons profitably there is the P&H 255A-TC. Here is Brown & Root's third Model 255A-TC shown at work on construction of off-shore drilling platform at their Marine Division Shipyard.

CONNECTICUT

Earthmoving Service & Equip. Corp., profits from the greater strength of the 2½ yd. P&H 955A in moving tremendous quantities of borrow. Job is part of new Connecticut Turnpike.

VIRGINIA

In the ¾ yard class, Commonwealth Sand & Gravel Co. of Richmond depends on the speed and accuracy of the P&H 255A for increased production. It is shown here equipped with 40 foot boom and ¾ yard clamshell bucket.

Write today for Verified P&H Cost-Performance Facts

Harnischfeger Corporation, Dept. 502-A
Construction & Mining Division
Milwaukee 46, Wisconsin

Gentlemen:
Please send me field report No. 5504 on the 35-ton P&H 555A-TC.

*Name*____________________

*Title*____________________

*Firm*____________________

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*City*__________ *Zone*_____ *State*________

Presto! a new floor in a few hours with FLINTMASTIC†

Your trowel is your magic wand! And the "wonder resurfacing material" that almost overnight can change old worn floors into comfortable, durable, tough surfaces is FLINTMASTIC!

Perhaps you need to repair holes or smooth over damaged areas. FLINTMASTIC does this kind of work fast and efficiently, too. And FLINTMASTIC also fills the bill when it comes to a resilient leveling course as underlayment for decorative floor coverings.

FLINTMASTIC is asphalt mastic flooring made with famous *Flintkote Clay Emulsions* mixed with cement and aggregates. It can be applied over new or old floors . . . thin or thick. Floors are quiet, comfortable underfoot, shock-absorbing, non-slip, water resistant. They carry the heaviest plant traffic without rutting or cracking.

Do you want complete information for installing FLINTMASTIC mixes? Just write us today for specification I-C No. 209.

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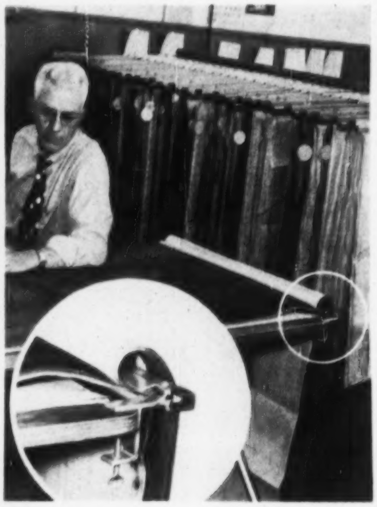
FLINTKOTE INDUSTRIAL PRODUCTS

FLINTKOTE

highway regulations. The trailer body's fully automatic door is essentially the same as on the company's mine and quarry drop door truck bodies and trailers. As the body is raised or lowered, the door is opened or closed automatically. EASTON CAR AND CONSTRUCTION CO., EASTON, PA.



Clamps Support Plans On Table During Use

A set of table clamps designed to hold a fully loaded plan holder in place while the user leafs through the sheets now is available.

These aluminum clamps fit onto the end of a table to offer a support for the prints when bound in Plan Hold vertical filing brackets. In this way easy access and support is provided during use for all prints—even to the last.

Simplicity of operation is the keynote, according to the manufacturer, since no tools or fasteners are needed to place or remove a plan holder from the table clamps. PLAN HOLD CORP., 5204 CHAKEMCO ST., SOUTH GATE, CALIFORNIA.

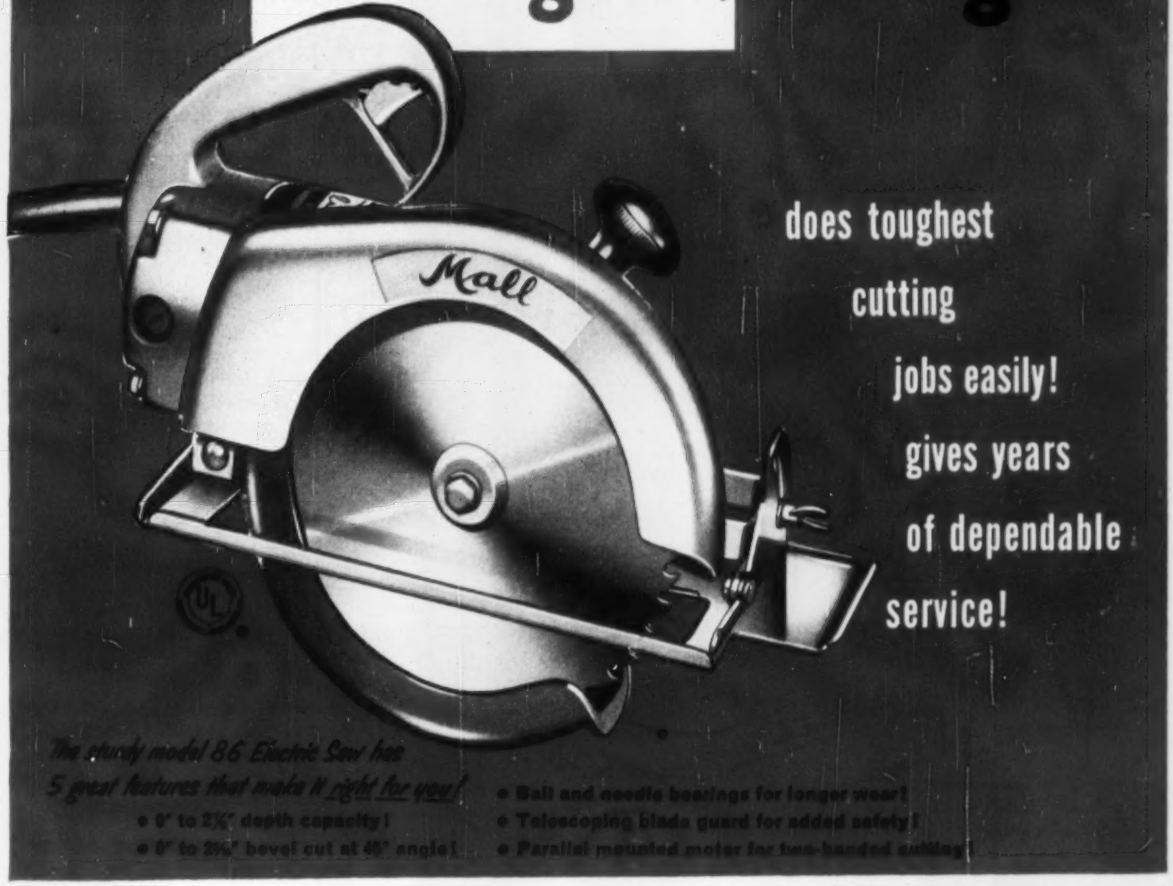
Lightweight Jacket Made For Use in Cold Weather

Designed for severe cold weather use, a lightweight jacket filled with goose down is now available.

The jacket weighs only 24 oz, has an outer surface of water-repellent nylon and an interlining. The manufacturer says that the garment can be washed by hand and that washing makes the down filling fluffier and increases insulation qualities. ALASKA SLEEPING BAG CO., 723 N. W. 18TH AVE., PORTLAND 9, ORE.

now, in industrial tools, too,

if it's Remington, it's right!



The sturdy model 86 Electric Saw has 5 great features that make it right for you!

- 0" to 2⅞" depth capacity!
- 0" to 2⅛" bevel cut at 45° angle!
- Ball and needle bearings for longer wear!
- Telescoping blade guard for added safety!
- Parallel mounted motor for two-handed cutting!

Model 86—*equipped with wrench, steel case, 15 foot cord, plug and ground; AC or DC, 25 to 60 cycle; 115 volt or 230 volt models available.*

Specifications subject to change without notice

Remington

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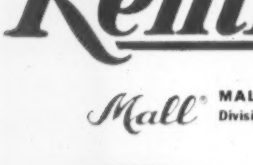
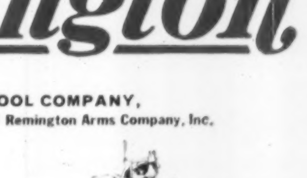


Concrete Vibrator, Model EV25. Lightweight, one-man operation. Universal electric motor, 115 volts, AC-DC, 10,000 vpm.



Concrete Vibrator, Model 7GVW21. 5 hp. gasoline engine. Two heavy duty models—7,000 vpm. and 10,000 vpm.

Precision-built for superior performance!

Here's a saw that gives you plenty of handling ease and maneuverability. Yes, now you can have portable electric saws by Remington, the newest name in the power tool field and famous for 141 years for quality in sporting firearms and ammunition.

The Model 86 electric saw was made to zip through construction and remodeling work. It comes complete with 8½" blade, saw dust blower and wing nut adjustment. Try it and observe the superior performance you get from the combination rip-cross blade. It was built to make tough jobs easy—as are *all* of Remington's famous Mall electric saws.

There's an electric saw by Mall Tool Company, Division of Remington Arms Company, Inc., for every kind of cutting job—in farming, industry and construction. For additional information, please fill out the convenient coupon.

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Publications

Bottom dump—An eight page booklet features the Athey PW20 bottom dump trailer, illustrating design and application features. Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill.

Backhoes—A Hyster D4 backhoe catalog featuring design and performance characteristics is available. Job performance, versatility and mobility resulting from matched equipment is discussed in detail. Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.

Truck tires—A new catalog covering the complete line of truck tires for off and on-highway use is a 16 page booklet that includes job payload performance and information concerning the tires' construction features. Catalog C-414, Lee Tire & Rubber Corp., Conshohocken, Pa.

Shaft mucking—The Joy JPG-200 pneumatic grapple for shaft mucking is subject of Bulletin 4-24. Details are given on operation and application of the grapple, which is said to be adaptable to most types of shafts. Joy Mfg. Co., Oliver Building, Pittsburgh 22, Pa.

Crane—Manitowoc has published a 16 page booklet describing its Model 3000 Series of 2 yd shovels, draglines and 40-50 ton cranes. Manitowoc Engineering Corp., Dept. MRS, Manitowoc, Wis.

Hour meter—The Hobbs engine hour meter, a timing instrument that records actual hours and minutes of engine operation, is the subject of a 12 page catalog (No. 600). The meters are said to be usable on all types of equipment powered by internal combustion engines, gasoline or diesel. John W. Hobbs Corp., Division of Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.

Tractors—Preventive and operational maintenance of crawler-type tractor parts are discussed in a brochure "Rebuild Worn Crawler Type Tractor Parts The Rexarc Automatic Way," Form No. 757. The different stages and conditions of wear patterns of tractor parts are illustrated together with a composite of the tractor parts that can be rebuilt automatically. The Sight Feed Generator Co., 38 E. Third St., West Alexandria, Ohio.

Optical tooling—A 56 page manual covering the basic principles of optical tooling contains photos and drawings illus-

find the *profits* in the *tough jobs* with a *BIG* LORAIN-85A

Wig-wagging a heavy-duty 3-yd. dragline bucket at the end of a 70-ft. boom, as shown in this picture, requires a machine with plenty of guts . . . lots of power, lots of endurance, lots of production . . . and that's why a Lorain-85A was chosen. Here are more reasons why Lorain-85A's measure up so well on all kinds of high-pressure, extra heavy-duty jobs — and why they can produce more profits for you!

MORE POWER — An abundance of power delivered through a torque converter that automatically adjusts engine torque to match exactly the machine needs . . . lots of "hang-on."

EASIER CONTROLS — Only 2 hand levers to actuate Lorain "Joy Stick" air power controls — reduce effort, motion and fatigue — increase speed, comfort and production.

MODERN MOUNTINGS — The new "Shear Ball" mounting that revolves the turntable on a huge, sealed "ball bearing" . . . eliminates all rollers, exposed roller path, center pin and nut with their requirements of adjustment and maintenance. Proven by 8 years of service, hundreds of installations.

OPERATOR-DESIGNED CABS — Just what the operators asked for . . . added comfort, convenience and efficiency. They *look* different — they *are* different.

MORE CRAWLER CHOICES — 2 sizes — one 15′ 6″ long x 11′ 10″ wide for general-purpose service as shovel, crane, dragline, clamshell or hoe. One extra long and extra wide (18′ 6″ x 14′ 2″) for maximum crane lifting capacities and wide-radius dragline and clamshell work. Both full-air controlled, of course.

LONGER SQUARE-TUBULAR-CRANE BOOMS — Patent-applied-for square-tubular-chord crane booms. They're lighter, stronger. You can lift more, can reach out farther and can reach higher up, to 240 ft.

HIGHER CAPACITIES — Up to 60 tons as a lifting crane — 2½ yds. as a shovel or hoe.

You won't find these features in any other comparable machine. That's why the Lorain-85A will do such a much better job for you. Your Thew-Lorain Distributor can give you the full story on this and other models in the Lorain line. See him today.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

ELECTRIC PLANT NEWS

Onan ELECTRIC PLANTS

MONTANA DAKOTA UTILITIES CO.

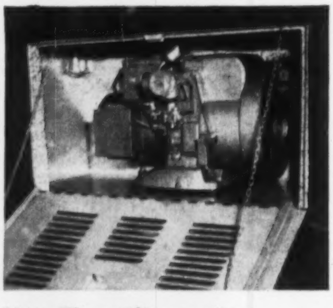
Truck-mounted electric plant cuts costs two ways

Onan Plant provides A.C. power for electric tools and lights, and D.C. output to charge batteries for radio communication.

Utilities using this dual-purpose Onan Electric Plant on trucks report savings ranging from *$2.00 per day* per truck to *$800.00 per year* per truck . . . for the battery-charging feature alone. Before installation of the Onan plant it was necessary to keep the large truck engine running to charge batteries, extremely wasteful from the viewpoint of fuel and engine maintenance.

The Onan plant shown is a Model O7AK, developing 750 watts of A.C. with about 8 amperes for 12-volt battery charging. It is powered by an Onan single-cylinder, air-cooled gasoline engine direct-connected to an Onan all-climate generator in a compact, rigid, long-life unit. A.C. output is sufficient for operation of drills, saws and other tools used for construction and maintenance.

Other vehicular battery charging plants and A.C. models available.



Vacu-Flo cooling system permits enclosed installation

With Onan's Vacu-Flo system, air is drawn (rather than blown) through generator and engine, and discharged through a duct to the outside. An Onan air-cooled plant with Vacu-Flo can be installed in a small compartment within truck or trailer.

Ask your Onan distributor about this dual-purpose unit or write for circular on three battery charging methods.

D. W. ONAN & SONS INC.

Onan ELECTRIC PLANTS

3061 University Ave. S. E., Minneapolis 14, Minnesota

ELECTRIC PLANTS • AIR-COOLED ENGINES • GENERATORS • KAB KOOLER

trating the major instruments and accessories used in this method of determining whether machine parts or similar items are straight, flat, plumb or square. Drawings explain the optical principles used in applying the equipment. Keuffel & Esser Co., Hoboken, N. J.

Pumping equipment—Specifications for pumping equipment for soil sampling, core drilling and pressure grouting are described in an eight page bulletin. No. 370. Sprague & Henwood, Inc., 221 W. Olive St., Scranton 2, Pa.

Western red cedar grades—A 36 page booklet illustrates and describes western red cedar uses and grades. Information includes replicas of grade stamps, conversion tables, recommended nailing practices and roof decking spans. Western Red Cedar Lumber Grades and Uses, West Coast Lumberman's Association, 1410 S. W. Morrison, Portland 5, Ore.

Frameless steel buildings—Description of and specifications for frameless steel buildings are included in a six page brochure, SX-13857. Armco Product Information Service, Middletown, Ohio.

Fiberglas laminates—A new eight page guide for the selection factors and comparative properties of Fiberglas laminates include relative costs per pound for each form available. Fiberglas Reinforced Laminates Selection Guide. Electrical Div., Owens-Corning Fiberglas, 598 Madison Ave., New York 22, N. Y.

Aluminum mill products—Mill products of aluminum, titanium and other metals are described in a 12 page brochure, "Mill Products and Alloys." Shapes, sizes and alloys of light and heavy press extrusions, press forgings and other products are included. Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.

Soil sampling—Soil samplers and accessories are described in detail in a 24 page booklet. Included are several new soil testing devices which are being introduced. Bulletin No. 300, Sprague & Henwood, Inc., Scranton 2, Pa.

Weight measurement and control—Bulletin 12 is a 20-page booklet on the weighing of bulk material. Comparisons are made between batch-in, batch-out and continuous weighing processes. The booklet shows how a completely automatic weighing system can be as-

Leading contractors say . . .
K-45 KOMPACTOR
most *profitable* to own

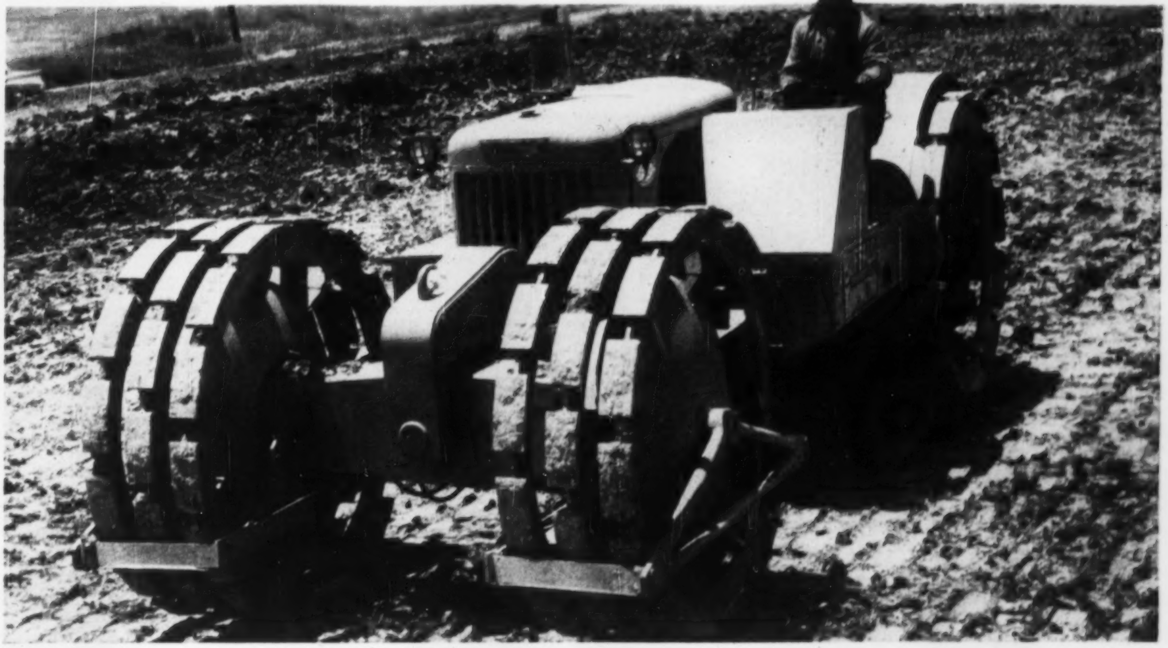
From all over the nation come new contractor reports that Buffalo-Springfield's K-45 Kompactor is *regularly* saving 50% or more over normal compaction time and costs. These records show that regardless of widely varied materials—K-45 compaction is faster, better and more efficient than was previously thought possible.

Such outstanding results come from the Kompactor's "Interrupted Pressure" principle of compaction . . . its fast speeds of 5 to 6 mph, self-propelled, in either direction . . . its high maneuverability . . . and its ability to work right up close to curbs, culverts and abutments to eliminate costly hand-tamping. These are a few of the K-45's superior performance features that *give* more to *get* more than with any other method.

Before you bid another compaction job, check on the K-45 with your nearest Buffalo-Springfield distributor. Let him show you how the K-45 does more work per day per dollar, brings you more profit. Ask him, too, for Bulletin S-67-455, or write today for complete information on this better, exclusive compaction machine. There's nothing else like it available.

Here, the K-45 Kompactor works up close—eliminates hand tamping on this California job.

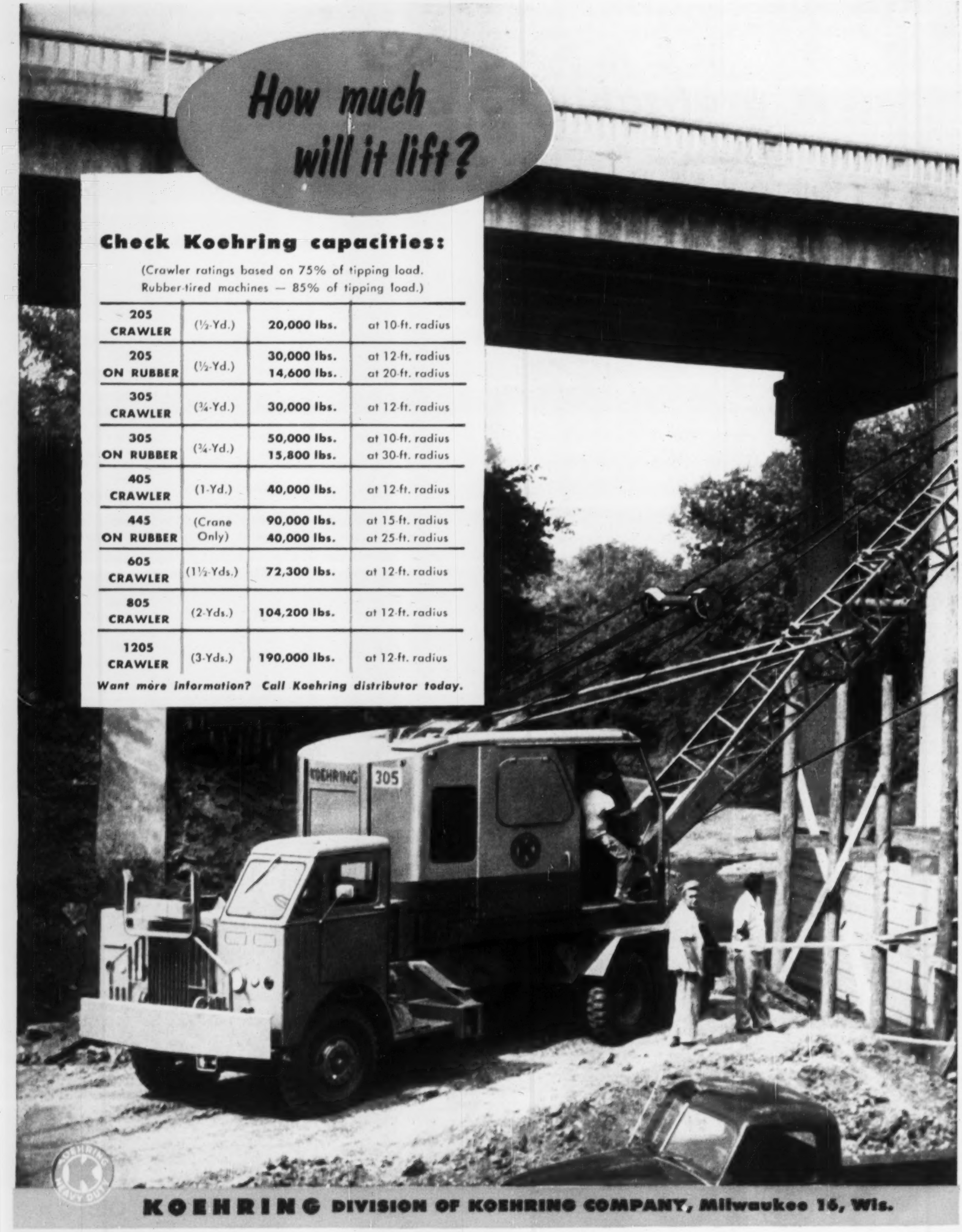
The K-45 Kompactor meets density specifications in fewer passes, faster, and at less cost.



Compacting adobe on a fill, this K-45 speeds up work for another leading West Coast contractor.

BUFFALO-SPRINGFIELD ROLLER CO.

DIVISION OF KOEHRING COMPANY · SPRINGFIELD, OHIO



How much will it lift?

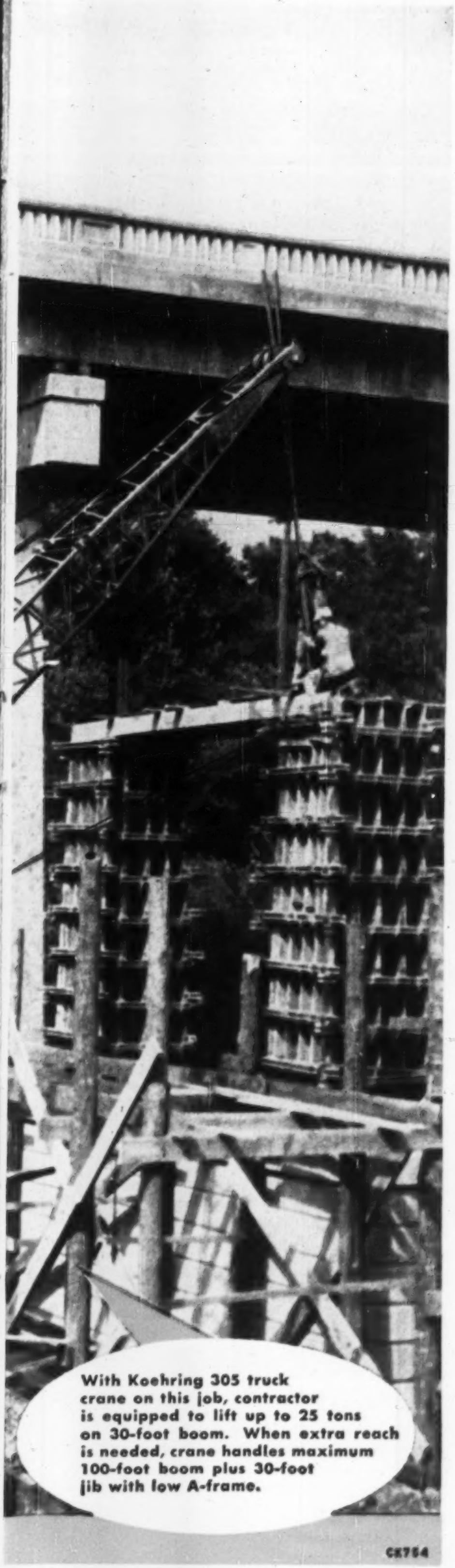
Check Koehring capacities:

(Crawler ratings based on 75% of tipping load.
Rubber-tired machines — 85% of tipping load.)

205 CRAWLER	(½-Yd.)	**20,000 lbs.**	at 10-ft. radius
205 ON RUBBER	(½-Yd.)	**30,000 lbs.** **14,600 lbs.**	at 12-ft. radius at 20-ft. radius
305 CRAWLER	(¾-Yd.)	**30,000 lbs.**	at 12-ft. radius
305 ON RUBBER	(¾-Yd.)	**50,000 lbs.** **15,800 lbs.**	at 10-ft. radius at 30-ft. radius
405 CRAWLER	(1-Yd.)	**40,000 lbs.**	at 12-ft. radius
445 ON RUBBER	(Crane Only)	**90,000 lbs.** **40,000 lbs.**	at 15-ft. radius at 25-ft. radius
605 CRAWLER	(1½-Yds.)	**72,300 lbs.**	at 12-ft. radius
805 CRAWLER	(2-Yds.)	**104,200 lbs.**	at 12-ft. radius
1205 CRAWLER	(3-Yds.)	**190,000 lbs.**	at 12-ft. radius

Want more information? Call Koehring distributor today.

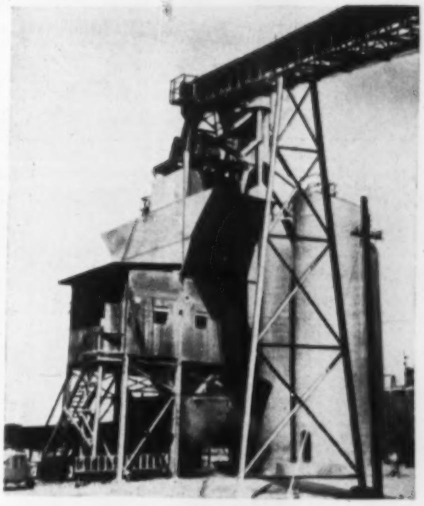
KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.



With Koehring 305 truck crane on this job, contractor is equipped to lift up to 25 tons on 30-foot boom. When extra reach is needed, crane handles maximum 100-foot boom plus 30-foot jib with low A-frame.

CK754

145 batches an hour on airport paving job



Supplying two 34-E pavers at new airbase, this Johnson one-stop automatic plant weighed out 1669 batches during an 11½-hour peak period—averaged over 145 batches hourly. Each 1.38-cu. yd. batch consisted of 5 materials: sand, 2 aggregates, 2 types cement. Johnson plants are available with multiple arrangements of single-material batchers, automatic push-button control, graphic weight-recording for any 1, 2 or 3-stop operation.

C. S. JOHNSON · Champaign, Ill.
(Koehring Subsidiary)

Producing concrete for foundation footings

When contractor was ready to pour footings he saved time and money by mixing his own concrete on the job — had the concrete just when he needed it. This Kwik-Mix 11-S is available on 2 or 4 wheels, with side or end discharge — has double-mixing action, automatic water system, tilted Flow-Line discharge, optional Batchmeter. Other sizes — 3½-S to 16-S. Also: plaster-mortar, bituminous mixers, material-handling Moto-Bugs®.

KWIK-MIX · Port Washington, Wis.
(Division of Koehring Co.)

Speeds installation of telephone cable

Opening trench 4 to 5 feet deep, 24 inches wide, for underground cable system, Parsons 150 wheel Trenchliner® averaged 1026 lineal feet an hour through rough, wooded country. It's a heavy-duty, high-production ditcher, digs 16 to 26 in. wide, at depths to 5¾ feet. Has hydraulic wheel-hoist, controlled discharge, quick-change buckets, optional tile-layer. Check Parsons line for any trench 8 to 72 in. wide, 19 ft. deep.

PARSONS · Newton, Iowa
(Division of Koehring Co.)

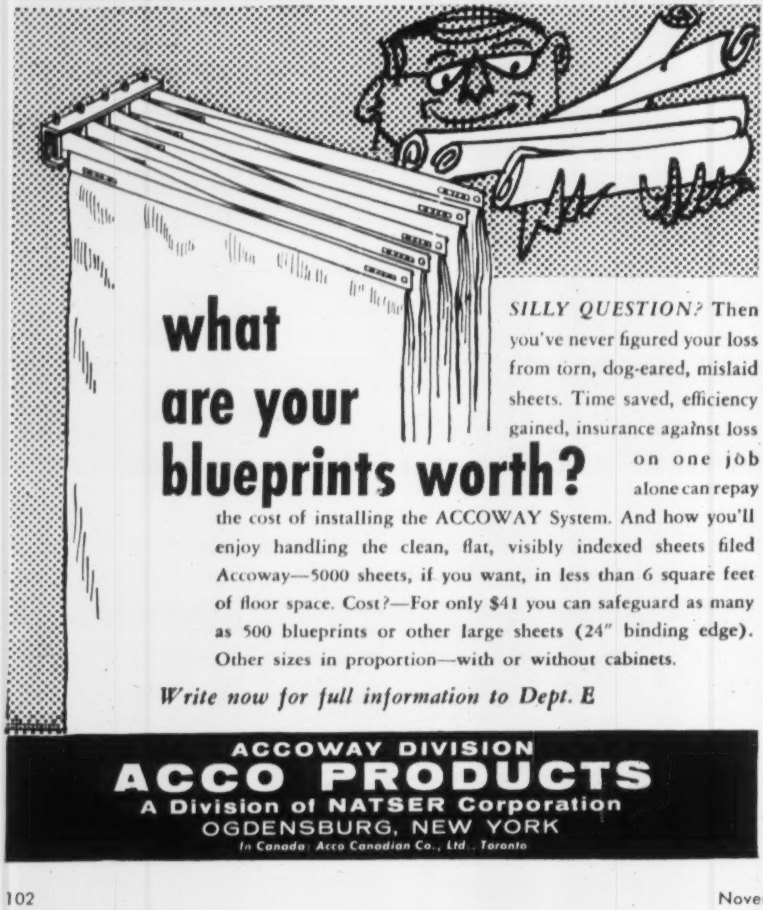
A70

Successful Usage Increases Demand for Swing-Lo Suspended Scaffolding

Now in use on **Calumet Skyway, Mackinac Bridge, New Orleans** Throughway; by **Highway** Departments and **Railroad** Maintenance Departments — for jobs on I-beams, girders, built-up beams, etc.

Roller Bearings Now On Scissors

Wide variety of **interchangeable** scissors and hangers suspend platform for easy access between beams or girders. Quickly erected and dismantled; light weight; sturdy; fully adjustable; safe; approved by NY Board of Standards. B-J Hooks for inside use. State your problem; write for literature. Swing-Lo Suspended Scaffold Co., Covert, Michigan.



what are your blueprints worth?

SILLY QUESTION? Then you've never figured your loss from torn, dog-eared, mislaid sheets. Time saved, efficiency gained, insurance against loss on one job alone can repay the cost of installing the ACCOWAY System. And how you'll enjoy handling the clean, flat, visibly indexed sheets filed Accoway—5000 sheets, if you want, in less than 6 square feet of floor space. Cost?—For only $41 you can safeguard as many as 500 blueprints or other large sheets (24" binding edge). Other sizes in proportion—with or without cabinets.

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sembled by the building block technique. Both pneumatic and electrical weight transmitters are discussed, and a special section explains the flexural scale system which gives correct weight readings even when asymmetrically loaded. Also included is a description of conveyor scales and weigher-feeders which can be added to existing systems. Weighing and Control Components, Inc., 406 Lincoln Ave., Hatboro, Pa.

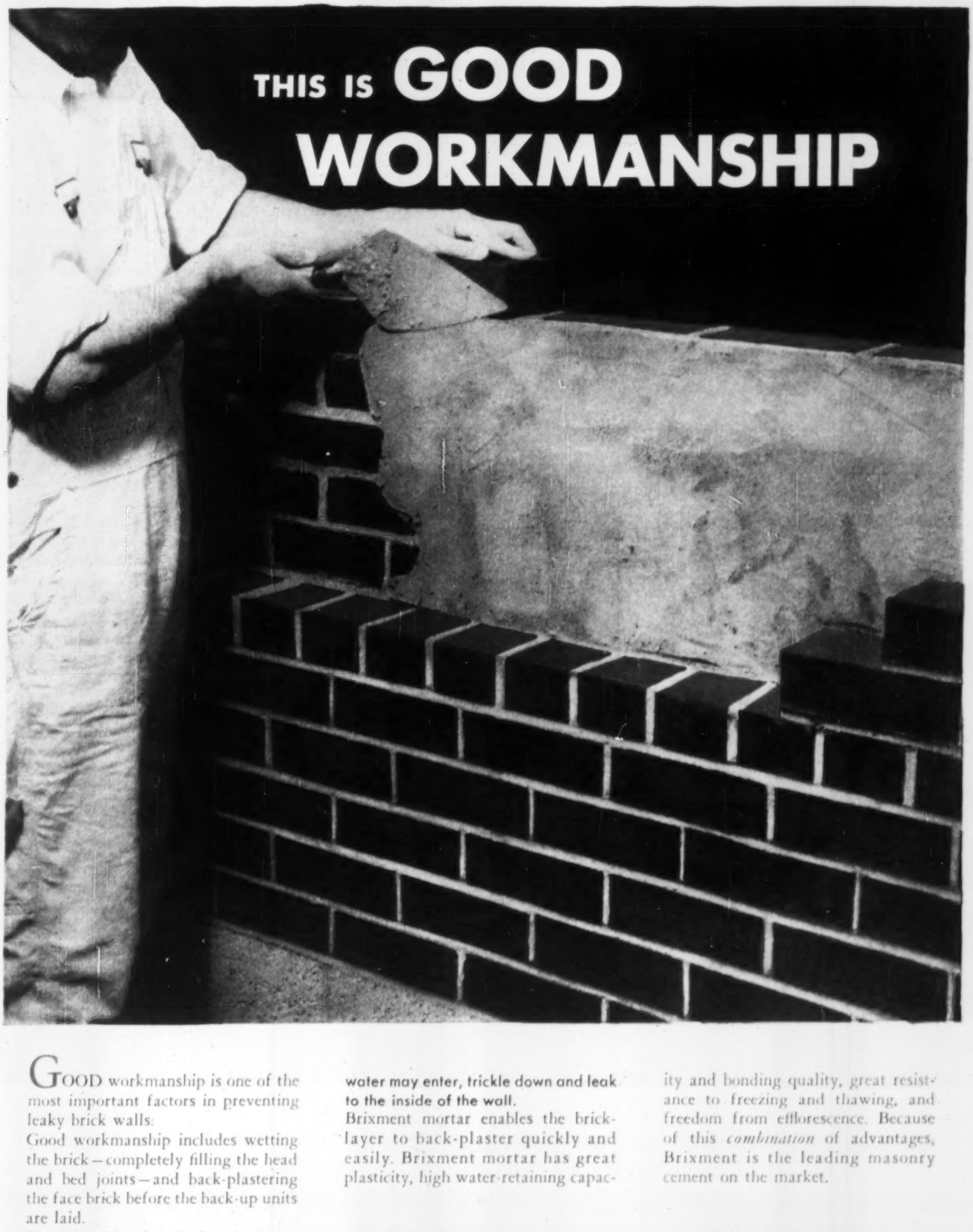
Sign blanks—A new brochure on aluminum highway and street sign blanks contains a complete list of sizes and specifications for standard blanks and calls attention to engineering services available in any design and production projects involving application of aluminum to highway problems. Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

Ditcher—A catalog covering all major components is now available on the Gar Wood Buckeye Model 403 ladder-type utility ditcher. Customer Service Dept., Gar Wood Industries, Inc., Wayne, Mich.

Hydrauliscope—A four-page illustrated and diagrammed bulletin gives technical data and other useful information on the Aeroquip Hydrauliscope. The instrument is an electronic analyzer utilizing oscilloscopic principles to measure pressure activity and phenomena in the operation of hydraulic systems. It is used to make accurate checks on the efficiency of hydraulic systems, determine smoothness of hydraulic pressures, and detect any undesirable shock or the surge in the circuit. Camera attachments, both polaroid and conventional are available to make permanent records of hydraulic activity. Aeroquip Corp., Jackson, Mich.

Valves—Bulletin G-5 is a four-pager that schematically shows various piping and valve arrangements for particular application, such as supply water to mill, accurate water level control in reservoirs, emergency fire protection and isolating part or all of a system. Golden-Anderson Valve Specialty Co., 1208 Ridge Ave., Pittsburgh 33, Pa.

Wind recorder—A four-pager, F-457, describes a wind speed-and-direction recording system, and illustrates typical installation concerned with atmospheric pollution. Engineering specifications, accuracy and sensitivity of the instruments are included. Beckman & Whitley, Inc., 994 E. San Carlos Ave., San Carlos, Calif.



GOOD workmanship is one of the most important factors in preventing leaky brick walls.

Good workmanship includes wetting the brick—completely filling the head and bed joints—and back-plastering the face brick before the back-up units are laid.

Expect trouble when the face brick are not parged. Even if the space between the face brick and the back-up units is slushed, it cannot be completely filled with mortar. Voids are left between the mortar and the brick, through which water may enter, trickle down and leak to the inside of the wall.

Brixment mortar enables the bricklayer to back-plaster quickly and easily. Brixment mortar has great plasticity, high water-retaining capacity and bonding quality, great resistance to freezing and thawing, and freedom from efflorescence. Because of this *combination* of advantages, Brixment is the leading masonry cement on the market.

BRIXMENT

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

A Look at How to Blast Concrete

How much TNT is needed to break concrete walls or beams?

New formulas answering that question have been proposed as result of recently completed studies performed by Stanford Research Institute for the Corps of Engineers.

This work is part of a major effort in the Institute's Poulter Laboratories toward gaining more information about high-explosive phenomena. Its approach is to study the highly complex progress of an explosion that SRI scientists describe as an extremely rapid yet quite orderly sequence of events.

The studies for the Corps of Engineers are aimed at revisions of the Army's Field Manual on explosives and demolitions. Thus, results are intended to aid military operations. However, the formulas also should be applicable to wrecking operations resulting from realignment of highways and rebuilding of cities.

One word of caution, however. These procedures involve the normal high-explosive hazards, and are noisy. They therefore must be muffled and used with care in populated areas.

The studies were based on the Army's standard demolition block of TNT that comes in ½ and 1 lb sizes. The larger is 1⅞x1⅞x7 in. The smaller is just half as long. The detonation velocity of this TNT is 21,000 fps.

The blocks have small holes drilled in one end to receive a blasting cap. Detonation is by use of a military-type blasting cap that is more powerful than the usual commercial cap.

For both walls and beams, the blocks should be placed to cover a maximum area. The research work on models indicated that a good rule of thumb is to make the charge only one block thick when up to 20 lb of TNT is used, and two blocks thick when from 20 to 80 lb of explosive are required.

The amount of TNT required to break a wall or pier can be determined by the following formula:

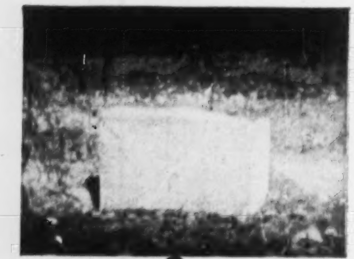
$$P = R^3KC$$

Where P = pounds of TNT required
R = thickness of the wall in feet
K = a material factor (see table)
C = a tamping factor

The tamping factor reflects additional power of the TNT when it is backfilled with wet sand bags or moist earth. Where there is no backfill, $C = 1.0$. And where there is backfill or tamping, $C = 0.6$. The charge should be placed at least a distance "R" above the base of the wall. Minimum recommended weight is 3 lb for unreinforced walls and 5 lb for reinforced walls.

For beams, the amount of TNT required is calculated from the above formula, if the charge is "tamped" with at least 10 in. of sand bags all around the explosive.

These charges were found sufficient to shatter the concrete so that it can be removed. Where a wall is long, several charges should be placed at intervals along the wall length. However, height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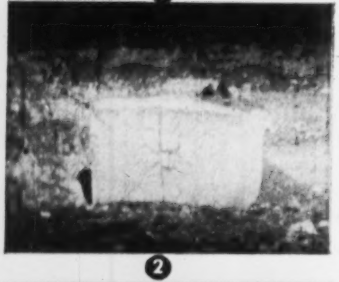
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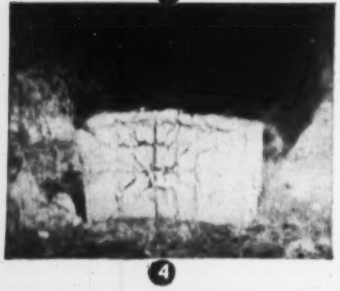
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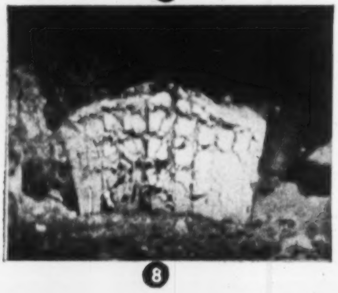
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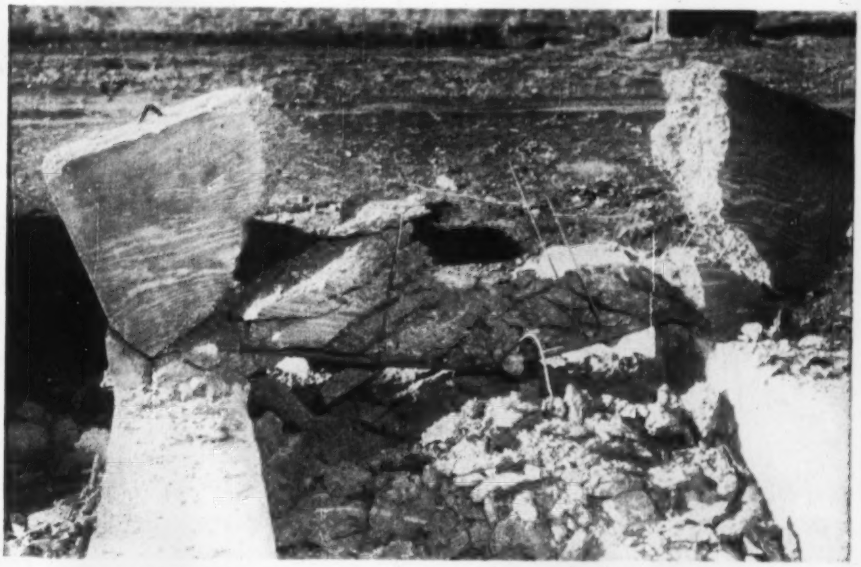
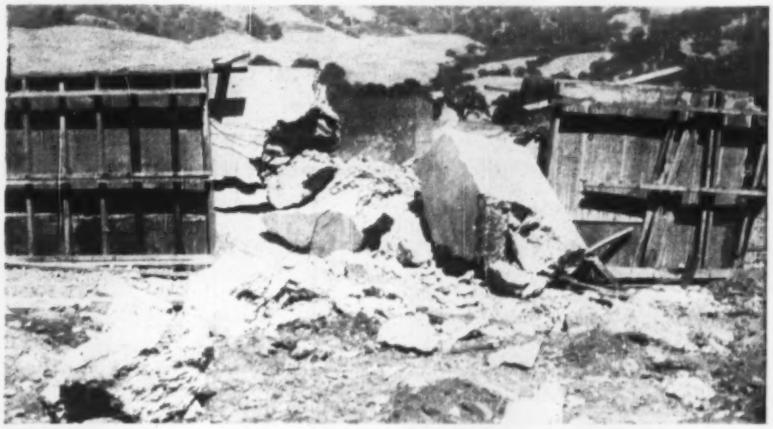
CONCRETE WALL SHATTERS under explosive charge as shown in these sequence photos. Reinforcing bars on 1 ft centers account for the pattern in the face of the wall.



CONCRETE BEAM, 2 ft deep by 1 ft wide, was destroyed by only 4 lb of TNT.



CONCRETE WALL, 3 ft thick, was shattered by only 20 lb of explosive.

of the wall makes little difference.

The explosive will not break reinforcing. This probably would have to be done with cutting torches. However, reinforcing has the tendency to expand the area of fragmentation due to vibrations that the explosive charge sets up in the reinforcing bars.

The research program also included studies of steel and wood cutting charges. It was conducted at the Menlo Park, Calif., headquarters of Stanford Research Institute.

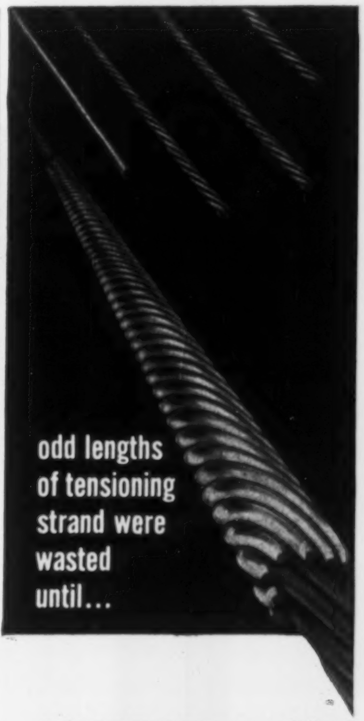
Material factor (K) for blasting walls.

R	Unreinforced	Reinforced
Less than 3 ft.......	0.95	1.66
3 ft to 5 ft..........	0.72	1.28
5 ft to 7 ft..........	0.54	1.00
7 ft and over........	0.56	0.89

Recommend Standards for Concrete Floor Finishes

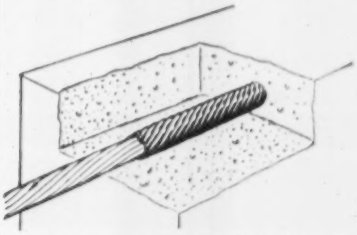
A report by a committee of the Concrete Industry Board, Inc., New York City, investigating unsatisfactory performance of concrete floors, finishes and fills points to a lack of uniformity in specifications for these items as a major cause of failure.

Among the recommendations made by the committee for the development of a standard specification and procedures is a structural slab integrally finished without a fill or finish placed later. Where fill is required a topping of at least 1 in. thickness should be placed as soon as possible on a roughened surface curing below.



...PREFORMED provided a splice that's stronger than the strand itself!

Now, Preformed Splices are used for splicing the strand used in pre-stressing concrete. You can salvage odd lengths of strand or save the strand when a wire breaks. Preformed Splices hold the full-rated strength of the strand and are available in the same material as the strand.

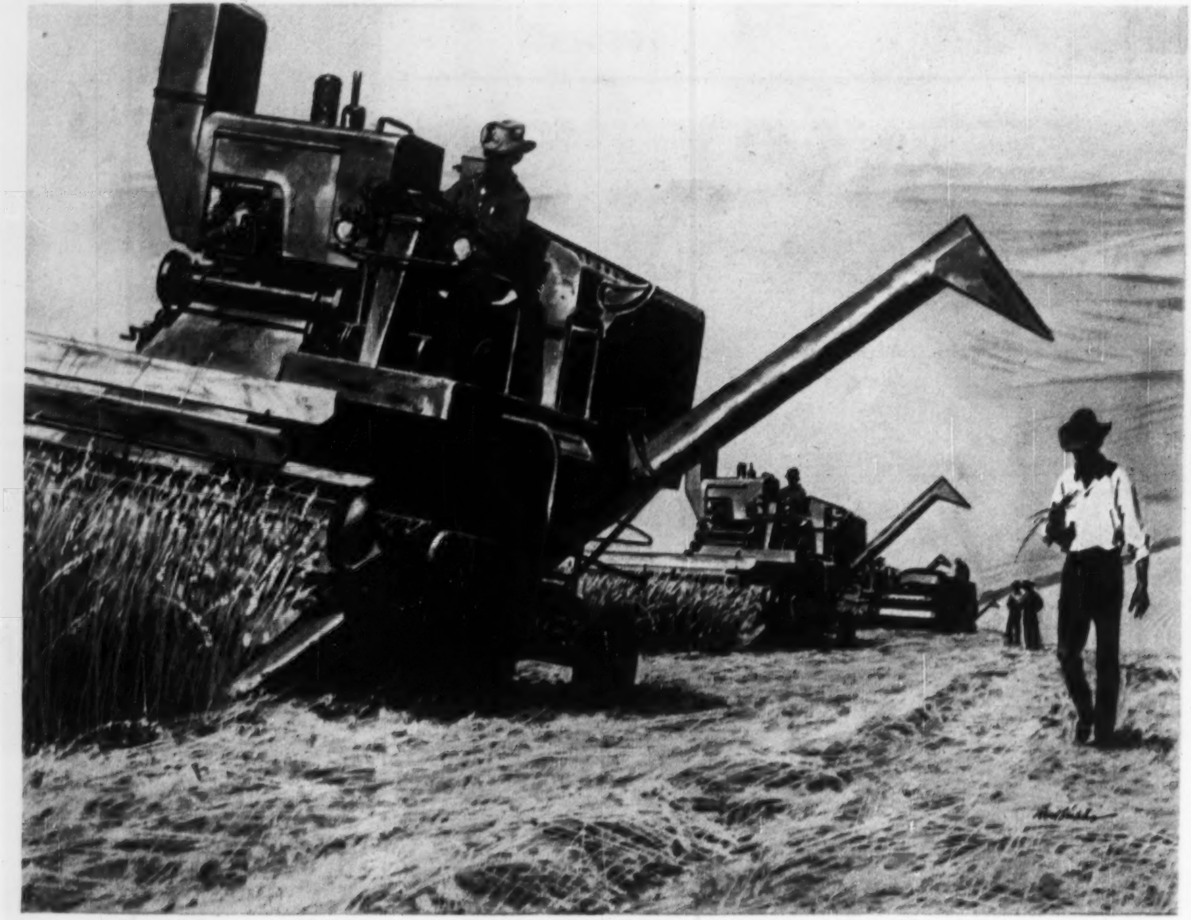


Are Preformed Splices and Dead-Ends the answer to one of your problems? Let our research and development people help you find out. Write PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable Address: Preformed-Cleveland.

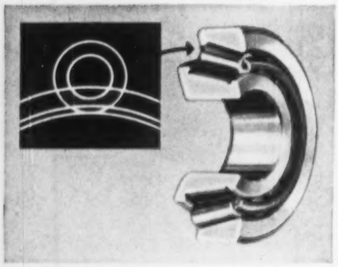
You can look up to

Preformed

Made in accordance with or for use under U. S. Patent Nos. 2,609,653, 2,275,019 and 2,587,521. Other patents pending.



Harvest time is no time for maintenance!



HIGHER FLANGE IMPROVES ROLLER ALIGNMENT

As shown by the gray area above, the higher flange provides a large two-zone contact area for the roller heads. This greatly reduces wear—practically eliminates "end play". Larger oil groove provides positive lubrication.

No one knows the importance of proper timing better than a farmer. Equipment has to be ready *when it's needed!* One breakdown—like a bearing failure—and everybody loses. Lost crop . . . lost money . . . and, for the equipment manufacturer, a lost customer.

That's why so many farm equipment manufacturers insist on dependable Bower Roller Bearings. Basic design improvements like those shown at left have made bearing failure a rarity. In addition, Bower's use of quality material plus close attention to engineering detail has virtually eliminated all maintenance requirements—makes these rugged bearings last longer, perform better.

Whatever *your* product, specify dependable Bower Roller Bearings. Choose from a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

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FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS

Men and Jobs

Authority on Surveying Heads Topo Division

George D. Whitmore, has moved from deputy to chief topographic engineer, Geological Survey, Department of the Interior. He succeeds Gerald Fitzgerald, who has retired.

For 12 years, beginning in 1933, he was chief of surveys for the Tennessee Valley Authority. In 1945 he transferred to the Geological Survey as chief of the technical staff of the topographic division, becoming deputy chief topographic engineer in 1956.

A past-president of the American Society of Photogrammetry, Mr. Whitmore is very active in the field, having written a number of books on surveying and photogrammetry. In 1956 he represented the Interior Department and Geological Survey at the International Society of Photogrammetry meeting in Stockholm. For the last two years he has served on a three-man special task committee of the American Society of Civil Engineers, to make a study of the status of surveying and mapping in the over-all field of engineering.

J. W. Wakefield to Head New State Water Agency

John W. Wakefield, who has been head of the sewage and industrial wastes division of the Florida State Board of Health at Jacksonville, has been appointed director of the newly created Department of Water Resources.

Headquartered in Tallahassee, the state organization was set up by the 1957 legislature to study and exercise control over water supplies in the state.

Moran, Cement Authority, Retires From USBR Labs

Willis T. Moran, chief of the chemical engineering laboratory branch of the U. S. Bureau of Reclamation's engineering laboratories at Denver, has retired after 37 years of government service, 26 of them in the bureau's engineering laboratories.

An authority on cement chemistry, Mr. Moran planned, organized and equipped the engineering laboratories' chemical laboratory, assisting in developing many types of special equipment for investigating properties of cements, mortars and concretes. He also participated in preparing initial ASTM low-heat Type IV, moderate heat Type II, and sulfate resistant Type V cements.

Mr. Moran is a chemical engineering graduate of the University of Denver.

Gen. Louis H. Foote To Retire from Corps

Brig. Gen. Louis H. Foote, Division Engineer, North Pacific Division, Corps of Engineers, will retire from the Army effective Nov. 30, after more than 30 years of service.

One of his charges during 3½ years as division head was directing the review investigation of the Columbia River "308" Report. The revised report covering the entire Columbia River Basin, including the Canadian portion, is scheduled for completion next June. Preliminary findings now are being circulated preparatory to public hearings.

Prior to his present position, General Foote was Alaska District Engineer, and before that he was Memphis District Engineer. He is a graduate of Washington State College, where he received his engineering degree in 1927, and obtained further training at the Engineer School at Fort Belvoir, Va.

Robertson Is Named Chief Of Technical Liaison

Col. Robert R. Robertson has assumed the duties of chief of the technical liaison division, Office of the Chief of Army Engineers, Washington, D. C. He succeeds Col. Roswell P. Rosengren, who is returning to civilian life.

Colonel Robertson will be staff officer directly responsible to the Chief of Engineers for public information activities of the Corps of Engineers. He is 50 years old and majored in civil engineering at the College of the Pacific.

Among his assignments with Corps was civil engineer on flood control works from 1930 to 1942, active service during World War II, command of the 30th Engineer Base Topographic Battalion from 1950 to 1953, and director of the Inter American Geodetic Survey from 1953 to 1956.

(*Men and Jobs continued on page 110*)

why work like

No need to when you lay Tyton Joint® pipe. This quick and easy-to-assemble pipe goes in so smoothly it's a pleasure to work with.

Only one accessory needed—a simple rubber gasket that fits in the receiving pipe bell and is compressed by the entering spigot to permanently seal the joint. No bell holes. No weather worries. Tyton Joint can be laid in rain or wet trench.

A word of warning, however: make sure your trenching machine gets an early start or

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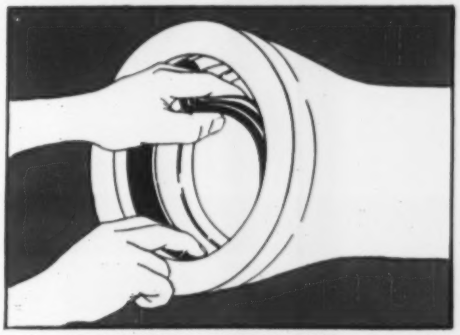
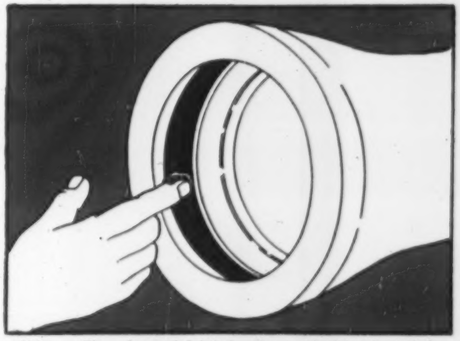
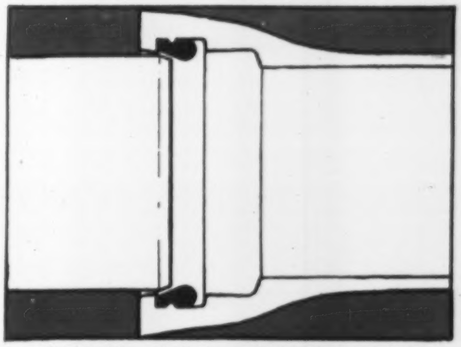


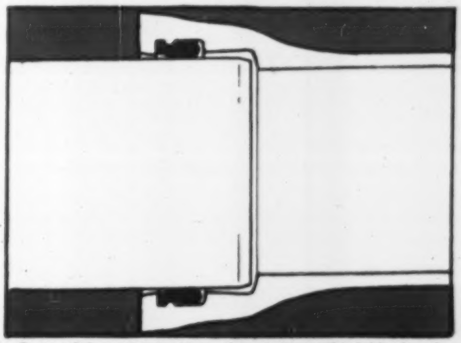
Insert gasket with groove over bead in gasket seat



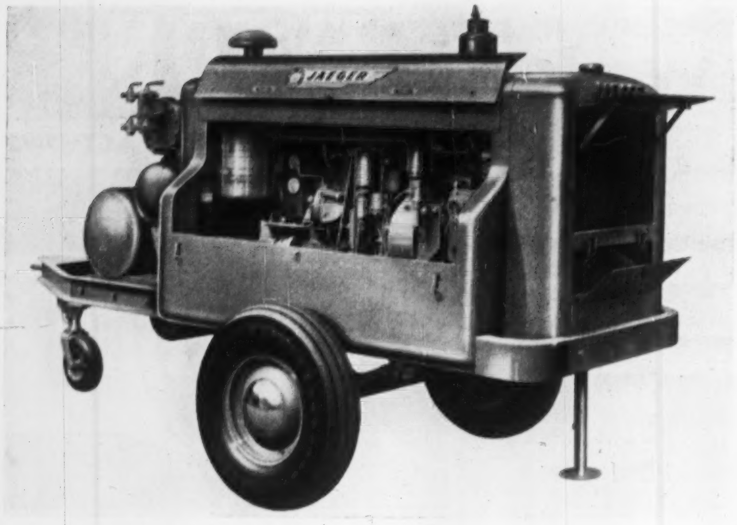
Wipe a film of special lubricant over inside of gasket



Insert plain end of pipe until it contacts gasket



Force plain end to bottom of socket . . . the job's done!



Jaeger "250" rotary *. . . biggest compressor on 2 wheels*

This easily trailed "250", gasoline or diesel powered, delivers 40 cfm more air than "old standard" 210 cfm compressors — operates an additional paving breaker, or a medium wagon drill, or 2 heavy duty rock drills or 10 hp air motor at full efficiency. Its 100 to 250 rpm slower operating speed (1700 rpm instead of 1800-1950) saves engine and compressor wear. Full size tool boxes, retractable pneumatic tired dolly wheel. Other 2-wheel sizes: 75 and 125 cfm; 4-wheel sizes: 365 and 600 cfm. ***See your Jaeger distributor or send for catalog.***

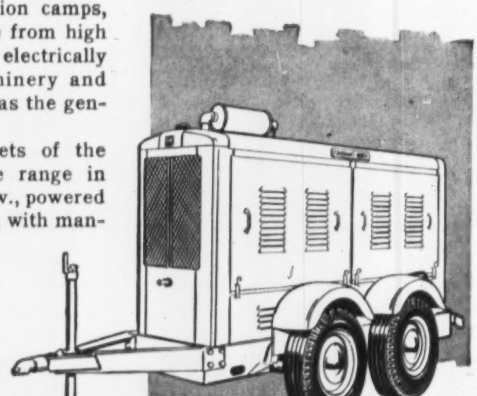
The Jaeger Machine Company, 200 Dublin Ave., Columbus 16, Ohio

FAIRBANKS-MORSE mobile power plants for outlying construction jobs

When you need plenty of dependable power for lighting construction camps, work trains and jobs remote from high line power . . . for operating electrically powered construction machinery and tools . . . Fairbanks-Morse has the generating sets you want.

F-M power generating sets of the mobile and permanent type range in capacities from 5 kw. to 125 kw., powered by gasoline, diesel or LP-gas, with manual or automatic starting. These units produce AC current in several voltages.

And for jobs where small, portable units are needed, Fairbanks-Morse offers generators ranging in capacity from 400 to 3000 watts, AC.



For complete details, send for the F-M generator catalog section. Write Fairbanks, Morse & Co., Dept.ENR-11-7,Chicago 5, Ill.

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Careers

Business

James R. Graves has been appointed senior design engineer of the bridge section of Patchen & Zimmerman, Engineers, Augusta, Ga.

Robert T. Lawson and **Warren D. Curtis** have been admitted as partners in the firm of Dames & Moore, soil engineers, Los Angeles.

Byron F. Whitford has entered private practice as a consulting engineer, resigning as village engineer in Hamburg, N. Y. He will specialize in subdivisions, sewage and water treatment and distribution.

Byron O. McCoy, of the engineering firm of Charles T. Main, Inc., Boston, has been elected vice president in charge of operations of Vermont Electric Power Co., Inc.

H. E. Hudson, Jr., has become a partner in Hazen & Sawyer, consulting engineers of New York City.

M. A. Vreeland has been made a partner in the engineering firm of Sanderson & Porter, New York City.

Walter R. Howat has been appointed Denver District Engineer for the Asphalt Institute to replace **J. F. Pearring**, who has resigned.

William A. McWilliams has joined De Leuw, Cather & Brill, New York City, as executive assistant. He was formerly director of the Delaware Memorial Bridge and chief engineer of the Delaware State Highway Department.

Charles R. Smith, president since the company's founding, has been elected chairman of Kuhn, Smith & Harris, Inc., New York City. Former treasurer **Thornton E. Smith** has been elected president.

Robert T. Browning, vice president directing sales and engineering activities, has been made executive vice president of Wallace & Tiernan, Inc., Belleville, N. J.

Russell C. Brinker, formerly professor and head of the civil engineering department at Virginia Polytechnic Institute, is now editorial director, engineering books, for Ronald Press Co., New York.

Carl L. Erb has become a partner in the consulting firm of Howard, Needles, Tammen & Bergendoff, of New York City, Kansas City and Cleveland.

Retirements

Richard H. Wilson, assistant state highway engineer for administration for the California Division of Highways, retired at the end of October, after 34 years of service with the state. A civil engineering graduate of the University of Michigan, Mr. Wilson held his last

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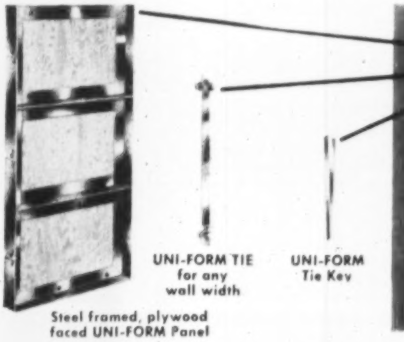
Why? UNI-FORM Panels can be erected faster, using less labor and material because the three basic elements of the UNI-FORM System—Panel, Tie and Tie Key provide simple mechanical assembly into any type of form. Unique system of attaching the minimum aligning lumber required reduces labor by 50% . . . pre-engineered techniques for handling pilasters, corners, stepped footings, columns, battered walls assure fast job progress.



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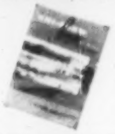
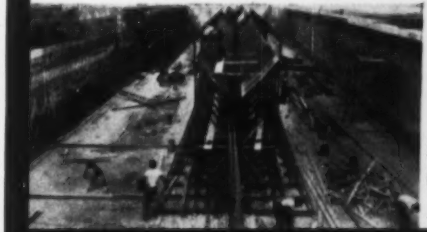
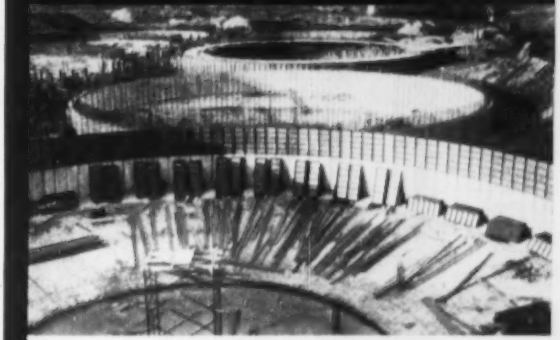




Sewage Treatment Plant "Y" Walls

Slabs



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LIMA ROADPACKER . . .
The cost-cutting vibratory compactor—proved on turnpike jobs

This is the hard-hitting, high-capacity machine that penetrates deeper—finishes a 13′ width in one to three passes.

On this Ohio Turnpike job near Cleveland, Ohio, the LIMA Roadpacker is compacting a bank run gravel sub-base to an 8″ high-density thickness. The LIMA Roadpacker's maneuverability was demonstrated efficiently on this job which required compacting operations in widely scattered sections—the problem of transporting cumbersome equipment and the duplication of units was eliminated.

Course aggregate for macadam bases up to 12″ thick can be spread in a single layer, then uniformly compacted to final density over a 13′-1″ width with the LIMA Roadpacker.

Single spread, which is permissible only with the vibratory method, reduces material handling by one-half or more—it eliminates backtracking of spreading equipment and contour shaping is needed only once.

The action of the vibration "runs in" screenings to full depth of macadam with only three operations. Much of the labor formerly required to spread, broom and roll is eliminated. The versatile LIMA Roadpacker performs with equal efficiency on both full-width and widening jobs.

Here's how the LIMA Roadpacker speeds up paving operations.

- Drives to job at 30 MPH.
- Compacts equally well traveling forward or reverse—no deadheading or turning around when two passes are required.
- Covers a 13′-1″ width, one-half of a two lane road.
- Operator can easily fold end shoes for narrower working widths or for highway travel. Shoes are raised and lowered hydraulically.
- Low maintenance—all working parts are completely enclosed, can even operate under water or dirt. Shoes are driven hydraulically and are pressure-lubricated.

A fact-filled 4-page folder tells how the new LIMA Roadpacker will help you make more paving profits. Write for your copy today.

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post for more than 10 years, during which time his functions included those of office engineer and head of city and county cooperative projects. One of his major responsibilities was translation of highway construction plans into contracts, an operation currently running at the rate of $200 million a year.

University of Michigan faculty members who recently retired with the following emeritus titles are: **George M. Bleekman,** assistant professor of geodesy and surveying, **Robert H. Sherlock,** professor of civil engineering, **Edward Young,** professor of geodesy and surveying.

H. Clyde Amesbury, traffic engineer of the California Division of Highways District 2, retired Oct. 1 after more than 40 years in highway construction work.

J. A. Smith, Jr., has been named Maryland district right-of-way engineer for the lower Eastern Shore, for the State Roads Commission.

Clarence W. Burmingham has retired after 37 years with the U. S. Bureau of Reclamation. Among his assignments was compiling engineering data for the Central Valley project in California, and for the Klamath project in Oregon and California. He later was assigned to the Bureau's Region II planning office in Sacramento.

Associations

Victor M. Ehlers, state sanitary engineer of Texas, and **Morris M. Cohn,** editor of Wastes Engineering, were made honorary members of the Federation of Sewage & Industrial Wastes Associations at its recent annual convention in Boston.

Paul E. Grunau, secretary-treasurer of Paul J. Grunau Co., has been elected president of the Allied Construction Employers Association in Milwaukee.

Henry J. Hoeffer has been appointed staff executive for programs of the National Safety Council, Chicago. A civil engineer, he retired last July with the rank of brigadier general after 30 years' service with the Army.

R. B. Fitzgerald of Winston-Salem has been serving as the departments Carolina State Highway Employees Association.

Lt. Col. Wesley D. Alcorn has been appointed district engineer at Chicago, serving Illinois, for the Asphalt Institute. Colonel Alcorn joins the Institute after his most recent assignment at the U. S. Army Engineering School at Ft. Belvoir, Va., where he was chief of the Troop Construction Branch.

Garnet T. Page has been appointed assistant general secretary of The Engineering Institute of Canada, headquartered in Montreal.

WANTED! Engineers who can cut costs without sacrificing quality

Who wants them? Just about every corporation, government body and engineering firm faced with today's high construction costs. Hundreds of intended projects need engineers who know how to use more efficient designs and construction methods.

To satisfy this demand, many engineers utilize the Butler Building System for single-story construction. Butler provides a pre-engineered structural and roof system that is precision-made, mass-produced and load-tested to conform with uniform, state and municipal codes.

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The engineer spends less time and money on routine details—is better able to maintain quality while keeping a tight control over costs—cost of the basic structure . . . cost of installing heating, lighting, cooling and ventilating units . . . and cost of exterior and interior finishing.

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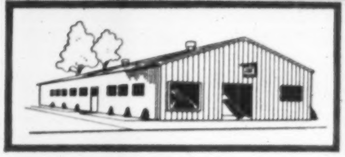
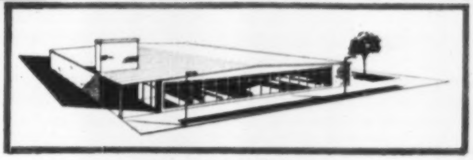
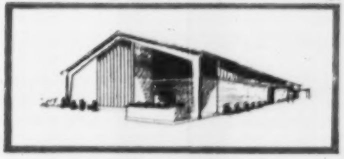
on the lowest cost way to build well, consult with your Butler Builder. He'll explain how he can cooperate with you on your building projects. He's listed under "Buildings" or "Steel Buildings" in the Yellow Pages. Or write us direct.



All-metal Butler



New low-profile Butler



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AMPLE DEFLECTION

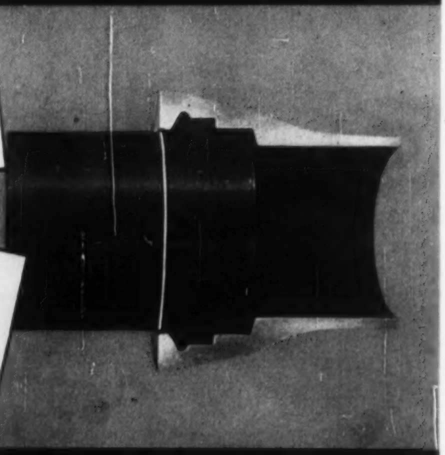
Photo shows how easily Clow Bell-Tite joints handle casual curves or normal grades without fittings.

TIGHT JOINTS

Full length, restrained joint, bursting tests prove Bell-Tite joint, even fully deflected, is stronger than the pipe.

FAST INSTALLATION

Above, Clow 8" Bell-Tite pipe being installed at the rate of 25 joints per hour. No bell holes are required.



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Wipe clean, lubricate, and push spigot into bell. When painted yellow stripe disappears, joint is bottle-tight!

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cast iron pipe

Here's the new time-saving, labor-saving, money-saving way to lay watermain. A single gasket, rubber seal joint that requires no bolts or follower glands to make a tight, dependable joint. Listed by the Underwriters' Laboratories, Inc., for water working pressures up to 350 psi, the pipe itself meets all applicable provisions of AWWA, ASA, and Federal Specifications. Complete details gladly rushed to you on request.

*Patent applied for.

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Obituaries

Charles A. Kendall, 58, engineer, died Sept. 6 in Quincy, Mass. He was engineering consultant for Turner Construction Co. in Boston.

Carl A. Schram, 65, contractor, died Sept. 9 in Portland, Ore. He was a partner in Parker-Schram Co., general contractors, and president of the Pacific Northwest branch, Associated General Contractors of America.

Ralph E. Woolley, 71, construction engineer, died in Honolulu Sept. 15.

Thomas A. Moynahan, 70, contractor, died in Ft. Wayne, Ind., Sept. 17. He was president of Moynahan Construction Co.

J. H. Monaghan, 62, past president of the Colorado Contractors Association, died Sept. 20, in Denver. He took over his father's business in 1931 and renamed it the J. H. & N. M. Monaghan Construction Co. Among the highway projects in which the firm participated were the Kansas Turnpike and the Denver-Boulder Turnpike.

Meade A. Spencer, 64, architect, died in Cleveland, Oct. 7. He studied at Princeton University and Massachusetts Institute of Technology. He was associated with Charles Bacon Rowley & Associates, Cleveland architectural firm, at the time of his death.

Capt. Carl A. Carlson, CEC USN (ret), 81, who served in the Navy's Civil Engineer Corps for 43 years, died Sept. 23 in Sacramento. A graduate of Case School of Applied Science, Captain Carlson entered the Civil Engineer Corps in 1903. He retired in 1940 but was recalled three months later and served until 1946. He had a variety of assignments, including public works officer of the 12th Naval District headquartering in San Francisco. Other duty stations include Subic Bay in the Philippines, Mare Island Navy Shipyard, Arlington, Va., and Portsmouth, N. H.

Albert W. Hutton, 67, secretary of Sam W. Emerson Co., died in Cleveland Sept. 21. He studied architecture at the University of Edinburgh. Prior to joining the Emerson firm he had been with John Gill & Sons, general contractors.

Gilmore Ware, 54, former president of Pacific Bridge Co., died Sept. 24 in San Francisco. He retired as head of the construction firm three years ago, but remained on the board of directors.

DUMPCRETES help set records on GARDEN STATE PARKWAY

Villa Contracting Company and Weldon Contracting Company of Westfield, N. J., teamed up to average 5,080 lineal feet of 8 in. by 12 ft. concrete per day—to set a record of 7,980 ft. in 24 hours—using Dumpcretes. Contractors won bonus and still kept heavy traffic rolling over 13½ mile Jersey Parkway section during an intensive seven-week paving push.

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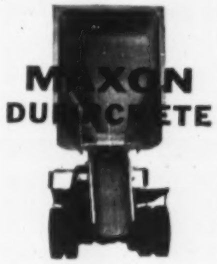
Dumpcretes can reduce:
Capital investment in equipment • Confusion at paving site • Downtime and labor costs • Wide shoulder maintenance.

Dumpcretes can give you:
Lower operating costs • *Flexible* delivery to paving site *and* structures • Closer quality control • Better production.



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Please send me new Dumpcrete Field Report.

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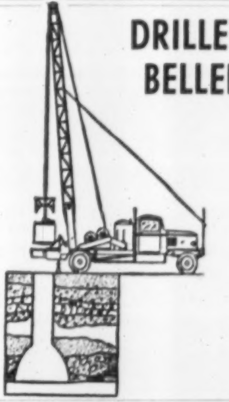

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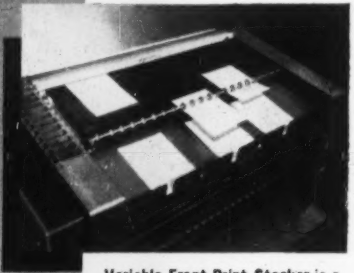

Variable Front Print Stacker is a Bruning exclusive! Control knob advances or retracts stacker for efficient, side-by-side stacking of prints.

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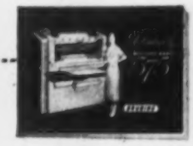

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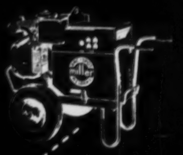

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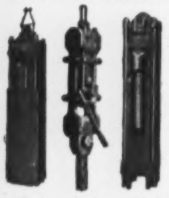

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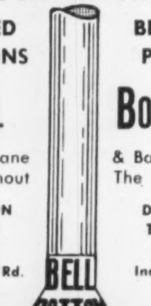

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Books

Noise Control in Buildings

Acoustics for the Architect—By Harold Burris-Meyer and Lewis Goodfriend. 126 pp. Reinhold Publishing Corp., New York 22, N. Y. $10.

Many architects encountering a tough acoustical problem in building design—and sometimes even a simple acoustical problem—call on a specialist for help. The object of this book is to provide building designers with sufficient information to enable them to handle most of their sound-control problems in their own offices.

The book begins with an outline of the types of acoustical problems designers are likely to encounter, such as maintenance of comfort conditions and achieving communication objectives. It then analyzes the nature of sound and discusses its behavior.

Next follows an analysis of the effects of various building components on sound absorption and transmission and a presentation of data on acoustical characteristics of building materials. After that comes a discussion of the effects of geometry – shapes and surfaces—on sound distribution, absorption and reverberation.

A chapter is devoted to use of electronic devices, to meet various communication objectives.

The last two of the eight chapters in the book deal with surveys, computations, tests and acoustical design procedure, the last proposing design objectives for various types of buildings. Charts, tables and check lists are presented to simplify design calculations.

Heating and Cooling

Air Conditioning—By Willis R. Woolrich and Willis R. Woolrich, Jr. 384 pp. Ronald Press Co., New York, N. Y. $7.50.

Written for professional engineers and architects, as well as for students, this textbook places heavy emphasis on the problems of maintaining comfort conditions indoors in hot-humid and hot-dry climates. It considers in detail psychometric processes, radiant cooling and methods of refrigeration.

The authors stress fundamental principles throughout. To keep the book within reasonable size limits, they chose to omit "quantitative" details of design procedure, much of which can easily be obtained from current trade literature and engineering manuals, and instead they rely heavily on "qualitative" discussions of fundamental problems.

The book is divided into four parts. The first covers thermodynamics, physi-

Barnhart Island powerhouse project shown here during summer concreting operations. Contractors: B. Perini and Sons, sponsor, with Walsh Construction Co., Morrison-Knudsen Co., Peter Kiewit Sons' Co., and Utah Co.

Barnhart Island Powerhouses Begin to Take Shape

During the summer the huge concreting operations at the International Rapids section of the St. Lawrence power project were going full speed ahead. The entire power project entails the placing of some 3,000,000 cu yd of concrete.

Shown here is a view of the twin Barnhart Island powerhouses, largest single job in the power project. Completed, the powerhouse will be a massive, steel-reinforced structure, 165 ft high, straddling the U. S.-Canadian border. For the portion of the job on the U. S. side, Bethlehem is supplying nearly 26,000 tons of steel reinforcing bars.

The St. Lawrence power project is being constructed jointly by the Power Authority of The State of New York and the Hydro-Electric Power Commission of Ontario.

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ological factors, heat transfer, load evaluation and fluid flow. The second is devoted to fuels, combustion and heating systems. Part III deals with refrigeration, cooling systems and all-year systems. And Part IV discusses distribution systems, instrumentation, sound control and filtration.

Structural Drafting

Handbook of Standard Structural Details for Buildings—By Milo S. Ketchum. 120 pp. Prentice-Hall, Inc. New York 11, N. Y. $4.65.

Helpful information for the preparation of structural drawings is compiled in this volume, which appears to be intended principally for students and others not too experienced in structural drafting.

The author points out that the term "standard structural details" indicates details of design that have stood the test of use in many design offices and are considered to be satisfactory. The details he presents he proposes merely as a guide and suggests that the student, as an exercise, check the designs for structural adequacy.

Except for an introductory chapter, which discusses such things as general arrangement of structural drawings, section marks and abbreviations, each of the book's seven chapters is centered around one type of building—masonry, reinforced concrete, steel, timber, residential and industrial. The details are related to the foundation or framing plans for these buildings. A discussion of them appears either on the same page or a facing page.

Reports & Pamphlets

United States Government Organization Manual—778 pp. Superintendent of Documents, Government Printing Office, Washington 25, D. C. $1.50.

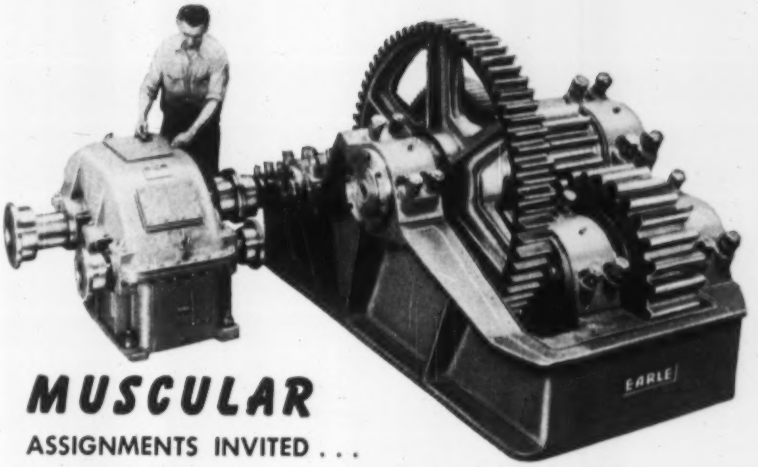
Some Cost Data on Prestressed Concrete Bridges—Bulletin 144. Highway Research Board, 2101 Constitution, Washington, D. C. 80¢.

Wood for Marine Use and its Protection from Marine Organisms—Special Technical Publication No. 200. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Freeze-Thaw Durability of Aggregate in Concrete—Bulletin 143. Highway Research Board, 2101 Constitution, Washington, D. C. 60¢.

Industrial Water Needs—54 pp. Oakland County Planning Commission, 1 Lafayette St., Pontiac, Mich. $2.00.

The Measurement of Small Angles Using Optical-Reading Theodolites



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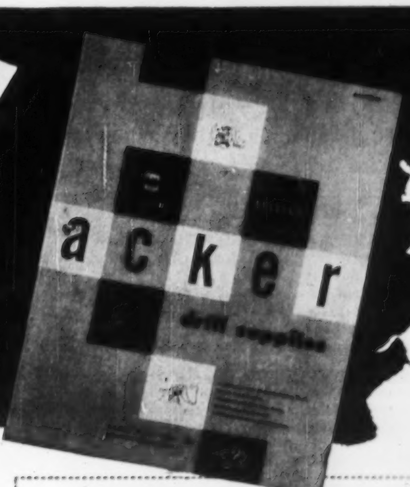

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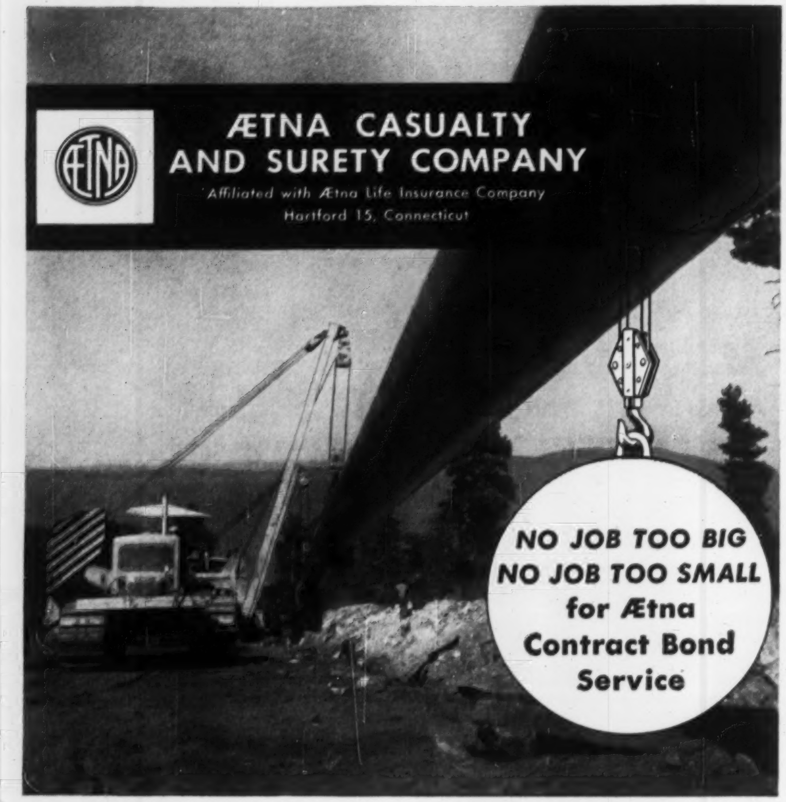

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AND AMERICAN-DESIGN TRANSITS—by Leland Barclay. Engineering Research Series No. 47. Bureau of Engineering Research, University of Texas, Austin 12, Tex.

PUBLIC SEWAGE TREATMENT PLANT CONSTRUCTION 1956—Public Health Service Publication No. 549. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15¢.

THE DESIGN OF A HEAT PUMP BURIED COIL—Bulletin 139. Texas Engineering Experiment Station, College Station, Tex. $2.00.

COLORADO-BIG THOMPSON PROJECT—Technical Record of Design and Construction—187 pp. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. $2.75.

MATHEMATICS FOR SCIENCE AND ENGINEERING—by Philip L. Alger. 360 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $6.95.

PROCEEDINGS OF THE EIGHTH TEXAS CONFERENCE ON SOIL MECHANICS AND FOUNDATION ENGINEERING—Special Publication No. 29. Bureau of Engineering Research, University of Texas, Austin 12, Texas. $5.00.

RELIGIOUS BUILDINGS FOR TODAY—183 pp. F. W. Dodge Corp., 119 W. 40th St., New York. $7.50.

ASTM STANDARDS ON BITUMINOUS MATERIALS FOR HIGHWAY CONSTRUCTION, WATERPROOFING, AND ROOFING—460 pp. Members $3.50; non-members $4.75. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

ESSENTIAL STRENGTH OF MATERIALS—by Frederick R. Kisarelli. 261 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $4.75.

ASTM STANDARDS ON THERMAL INSULATING MATERIALS (WITH RELATED INFORMATION)—208 pp. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. Members $2.25; nonmembers $3.00.

BRITTLE BEHAVIOR OF ENGINEERING STRUCTURES—by Earl R. Parker. 323 pp. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $6.00.

GLASS REINFORCED PLASTICS—276 pp. Philosophical Library, 15 E. 40th St., New York 16. $15.00.

MATHEMATICS AND COMPUTERS—by George R. Stibitz and Jules A. Larrivee. 228 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $5.00.

REINFORCED CONCRETE DESIGNER'S HANDBOOK—by Chas. E. Reynolds. 343 pp. Concrete Publications Limited, 14 Dartmouth St., London, S. W. 1, England. $4.00.

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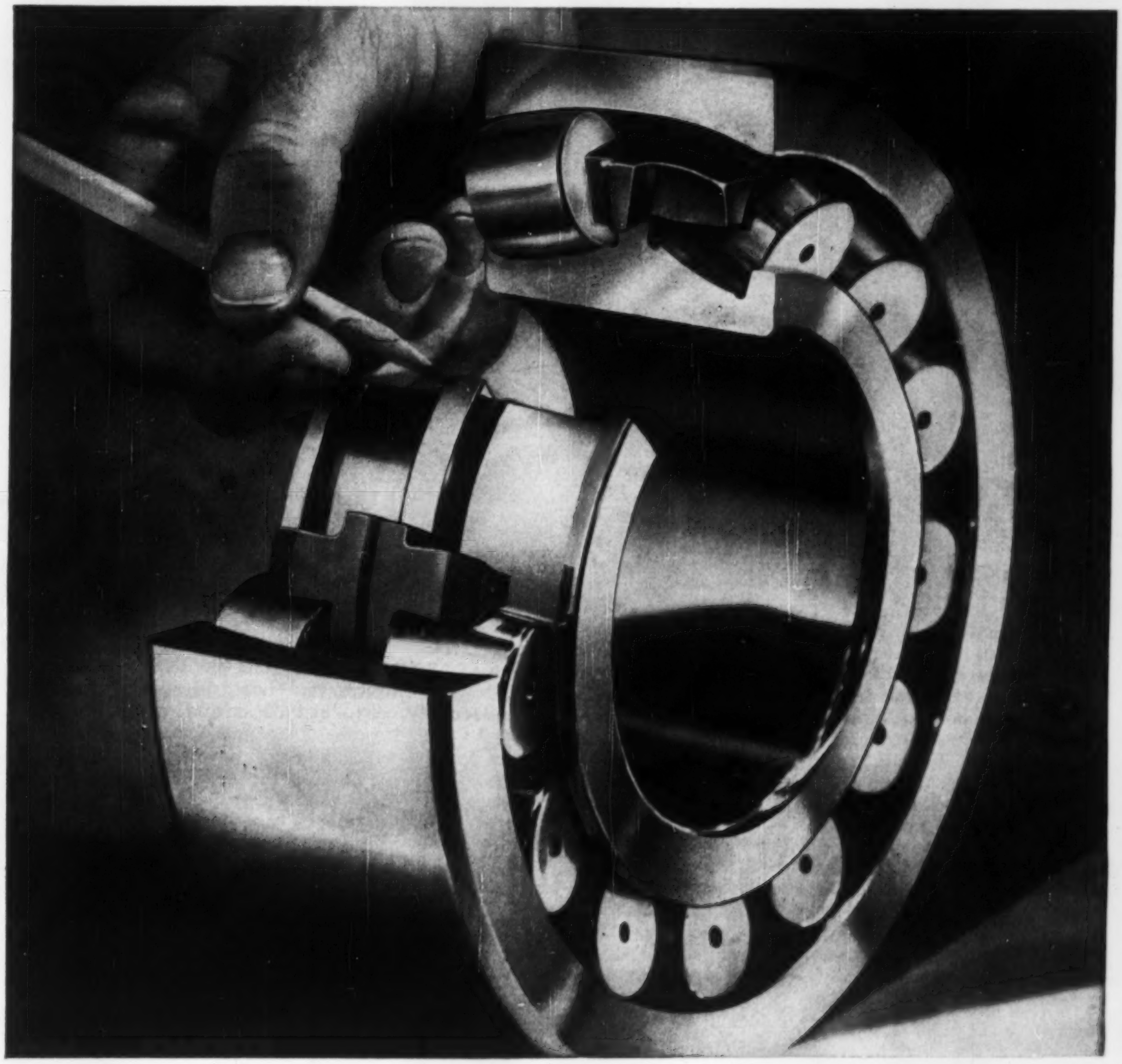

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A School in Texas

Ease of Installation counted heavily with the architect and builder who used Steeltex for concrete slabs on the Travis Junior High School in McAllen, Texas. Architect: Zeb Rike of McAllen. Contractor: W. E. Crawford Co. also of McAllen. Steeltex was chosen because of its "low cost, ample supply, ease of installation and low labor costs."

No wonder Steeltex is used everywhere when...

Steeltex saves 55 working days on one job

A Hotel in Nevada

Elimination of forms was cited as a distinct Steeltex advantage by the architect for this job, the Riviera Hotel in Las Vegas, Nevada. When a 200-room addition was planned, Steeltex was specified for that, too. Architect: Roy F. France & Son, Miami Beach, Florida. Consulting Architect: J. Maher Weller, Las Vegas. Contractor: Taylor Construction Co., Miami, Florida.

On big jobs or small . . . in the East, West, North and South, you'll find Steeltex. Architects and contractors like the way it speeds work, cuts costs and makes better concrete slabs.

Steeltex, the Pittsburgh Steel wire mesh reinforcing that carries its own waterproofed form right on its back, is the answer to a big question that designers and builders face constantly:

"How can we maintain or improve quality on our tight budget and move in quicker?"

In California, Designer Robert Sherman, C.S.D., credits Steeltex with pulling him out of a jam when heavy rains and windstorms delayed construction of the $2,800,000 Villa Hotel in San Mateo.

For a while, Mr. Sherman said, it appeared that bad weather would hold up the opening past the start of the 1956 Republican National Convention in nearby San Francisco.

"When weather conditions finally let us go back to work, Steeltex saved us 55 working days or 20 percent of the total construction time," he related.

A Hotel in California
Villa Hotel
REALTOR

Speedy construction possible with Steeltex pulled the builders out of jam in construction of the luxurious Villa Hotel in San Mateo, California. This is the job where Steeltex saved 55 working days. Designer: Robert Sherman of San Mateo. Contractor: Pacific Development Co.

A TV Station in Alabama

Low cost of changing plans when Steeltex is used made a hit with the builders of WSFA Radio and TV Center in Montgomery. Architects: John Shaffer and A. L. Williams Jr. Structural Engineer: Cecil Williams. Contractor: Bear Brothers Construction Co.

"We completed the hotel in time for the Texas delegation to occupy their reserved rooms."

Mr. Sherman, who has used Steeltex on everything from a closet-size used car lot headquarters to a big office building, said, "Builders who overlook using Steeltex on small jobs are missing a good bet."

Now, jump north to Erie, Pa., where E. E. Austin & Son, Inc., built a new Airport Terminal at the Erie Airport which was designed by Nelson, Goldberg & Heidt, registered engineers and architects. Construction Superintendent John McKinnon said: **"We've laid acres and acres of Steeltex. You can't beat it on costs. Why, Steeltex installed costs less than the lumber alone if we had to build forms."**

A similar commendation came from Texas where the $380,000 Travis Junior High School is the pride of McAllen, Texas. For that job, Architect Zeb Rike chose Steeltex for 43,698 square feet of second floor and roof deck because of its "low cost, ample supply, ease of installation and low labor costs for installation."

On the same job, Contractor W. E. Crawford declared he had always gotten "fine results with Steeltex."

"All you do is unroll it, tighten it, clip it and pour concrete. I'd recommend Steeltex any place a fine masonry deck is needed."

In Las Vegas, Nevada, where there's no gambling in building construction, Steeltex was specified by Architect Roy F. France Sr. for 108,000 square feet on nine floors of the Riviera Hotel and a new 200-room addition. Mr. France said:

"Steeltex eliminated extra work because it did away with forms. It permitted quick installation and made for a less expensive job."

On a new office and studio building for Station WSFA in Montgomery, Alabama—the $145,470 WSFA Radio and TV Center—the building schedule was tight because of commitments made to the FCC.

Here Architects John P. Shaffer and Albert L. Williams Jr. found:

"Steeltex let us get the building closed in quicker and also allowed us to change our minds on the layout of the floor conduits required by a modern TV and radio station. We were grateful that Steeltex permitted us to make changes with a minimum of loss and delay."

Steeltex can provide savings in time and money for you, too, while giving you better, higher quality slabs.

Cash in now on the advantages of using Steeltex. You can do it by calling the nearest Pittsburgh District Sales Office listed below. Do it today.

An Airport in Pennsylvania

The low cost of Steeltex compared to lumber for forms was cited during work on the new terminal at Port Erie, the airport at Erie, Pennsylvania. Architect: Nelson, Goldberg and Heidt of Erie. Contractor: E. E. Austin & Son, Inc., of Erie.

▶ See Sweets Catalog Section 2-B

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Unit Prices

Highway Widening in North Carolina

This $829,249 contract to Jesse M. Coble, Greensboro, requires 9.22 miles of subgrade reinforcing and concrete pavement to widen existing US64 and 70 between Hildebran and Conover, No. Car., for the State Highway Commission. E. L. Kemper is division engineer at Shelby.

Prevailing wages on the job include $1.00 an hour for common labor, $1.75 an hour for tractor operators.

Concrete is vibrated, air entrained, portland cement in a mix based on a modulus of rupture of not less than 550 psi at 14 days when tested with AASHO Method T 97. An air content of 4.5% by volume in the freshly mixed concrete is used to determine proportions. Mixing by weight at central plants shows cement content ranging from 1.30 bbl per cu yd with a yield of 5.192 cu ft/sack up to 1.55 bbl with a yield of 4.355.

In close bidding, the low was 5.6% below the second bid and less than 2% above the engineer's estimate. It went as follows:

1C	J. M. Coble, Greensboro, N. C.	$829,249
2	T. E. Ritter, Norfolk, Va.	878,671
3	Southern Roadbldrs, Inc., Augusta, Ga	898,231
EE	State Highway Comm, Raleigh, N. C.	814,000

Bids: 7-30-57 Items	Unit	Quantity	Unit Prices 1 C	 2
Exc, uncl & borrow	cy	55,000	$0.35	$0.50
drainage ditch	cy	50	0.75	5.00
Conc pave, rem exist	sy	300	1.00	1.00
Subg reinf	cy	20,500	4.25	4.70
CABC	t	15,500	2.35	2.45
BST, type CABC	sy	27,000	0.35	0.39
Conc pave, PC 8"	sy	172,300	3.89	4.05
endwalls, cl C	cy	2	80.00	100.00
RCP culv, 15"	lf	188	3.00	3.50
18"	lf	904	3.80	4.50
flared end sec 15"		6	35.00	50.00
18"		8	40.00	50.00
Brick mas catch basins	cy	4	75.00	100.00
Conc drop inlets & j boxes	cy	9	75.00	100.00
Gratings & frames, CB		2	50.00	80.00
DI		3	50.00	80.00
Comb conc curb & gut, 2'6"	lf	250	2.00	2.50

Completion Schedule: Paving by 1-1-58, Remainder of Work 6-1-58

Asphaltic Concrete Resurfacing in Ohio

In tight bidding Soda and Luscher Construction Co., Inc. Niles, Ohio, took this 7.967 mile combination reconstruction and resurfacing job at $557,965. This is less that 2% under the State's estimate. Work is in Ashtabula County for the Department of Highways, George J. Thornyer, acting director, R. A. Booth, administrator of contract sales.

Pavement is 20 ft wide, the roadway varies. Surfacing is asphalt concrete. Class E concrete for structures takes 5½ sacks of cement per yard.

Minimum wages include: roller and tractor operators $2.95, power scoops and scrapers $3.325, power shovels $3.57, common and semi-skilled labor $1.70 to $2.91.

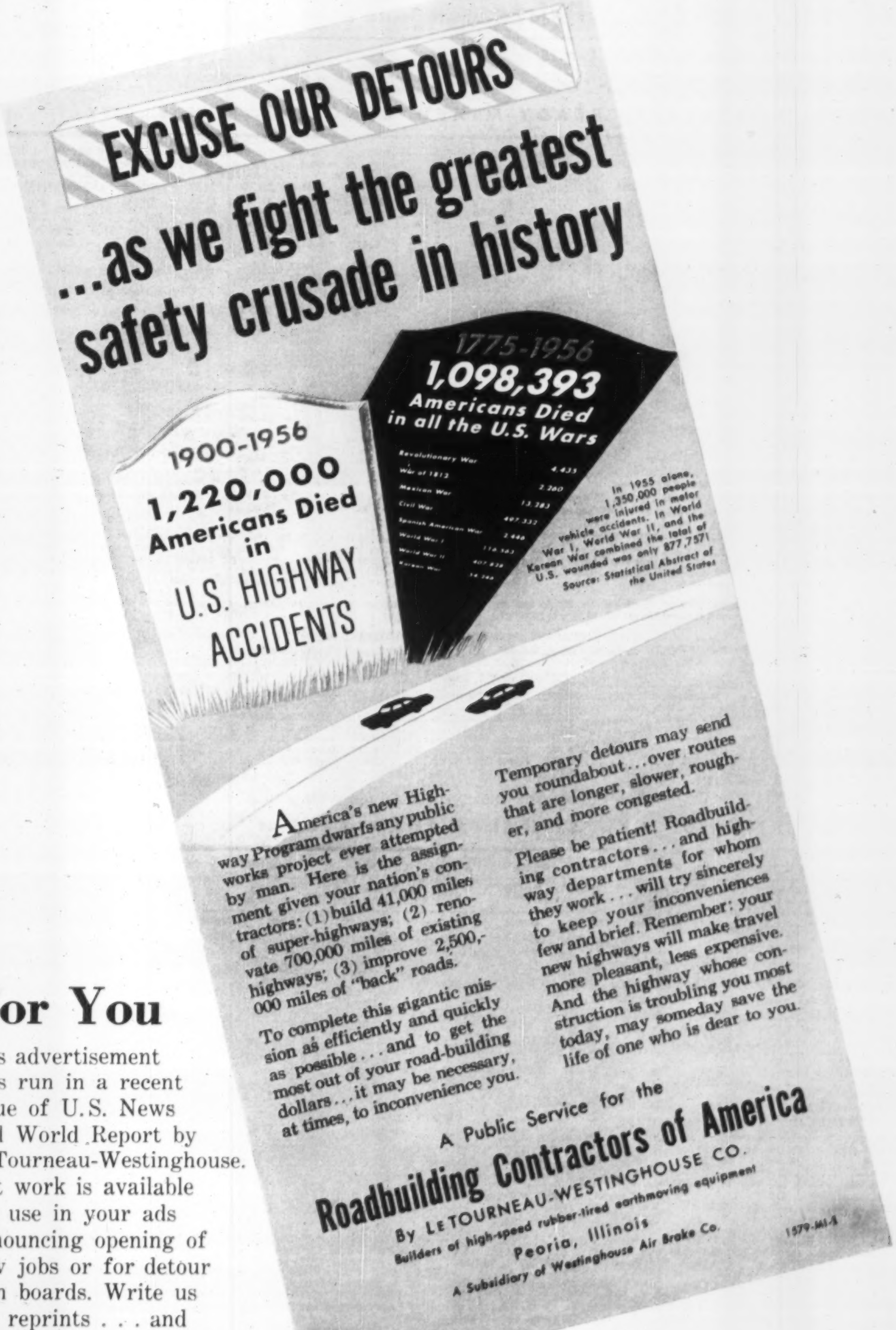
The contractor furnishes all materials.

The four bidders include:

1C	Soda & Luscher Const. Co., Niles, Ohio	$557,965
2	The Resar Service Co., Elyria, Ohio	558,205
4	Smith Constr. Co. of Ohio Vienna, Ohio	598,159
EE	Department of Highways, State of Ohio	568,500

Bids: 5-14-57 Items	Unit	Quantity	Unit Prices	 2
Road				
Excav, roadway	cy	114,252	$0.78	$0.67
Subgrade, compacted	sy	50,485	0.10	0.15
Remov & disp, exist wear crse	sy	16	2.00	1.00
Remov trees & stumps	ls	job	26,000	15,000
Water	Mg	524	7.00	3.00
Remov pipe, 15" & less	lf	1,233	1.00	1.50
for re-use, 12"	lf	18	3.00	4.00
12"	lf	36	3.00	4.50
Monument boxes, std	ea	6	50.00	50.00
assemblies	ea	24	75.00	60.00
Guard rail, stl bm tp shallow or flex stl pl tension tp SS	lf	725	3.50	4.00
Seed & protect	sy	251,705	0.07	0.09
Comml fertilizer (12-12-12)	t	23.60	110.00	120.00
Agric liming matl	t	118.04	18.00	30.00
Sodding	sy	10,603	0.80	1.00
Traffic compact surf for maint traffic	cy	500	4.00	4.30
Calc chl or calc magn chl, for maint traf f&a	t	10	70.00	70.00
Drainage				
Excav struct	cy	1,092	2.50	3.50
channel	cy	315	2.00	1.74
CMP, for drvways, 12" plain	lf	1,960	3.75	3.30
18" plain	lf	88	4.50	5.40
Storm sewers Cl A, 12"	lf	225	3.85	3.70
15"	lf	14	4.35	4.50
under pave or approaches, 12"	lf	165	4.40	3.70
15"	lf	50	5.00	4.50
Roadway drainage, 6"	lf	200	2.50	1.20
with porous backfill, 15"	lf	110	5.00	5.05
under pave & approaches, 15"	lf	24	6.00	5.05
Underdrains, 6"	lf	11,625	1.00	1.90
CMP, outlets, 8" plain	lf	617	3.50	3.20
Pipe specials for underdrn, 6"	ea	13	2.00	6.50
Spec for outlets for underdrain, 8" plain	ea	5	25.00	30.00
Pipe for drivwys, relay 12"	lf	26	2.00	3.50
Catch basins, std No 2-2-A	ea	5	175.00	200.00
Stone underdrains, No 2	lf	13,900	0.80	0.95
Riprap, tp A	sy	15	20.00	7.00
Dumped rock channel protection	cy	42	25.00	10.00
Conc for struct, class E	cy	37.9	90.00	96.00
Remov exist struct	ls	job	3,000	1,500
Roadway culvert, pipe 12"	lf	24	5.00	3.50
15"	lf	386	6.00	4.20
18"	lf	54	7.50	4.90
21"	lf	242	8.25	5.75
24"	lf	196	9.50	8.50
30"	lf	390	10.00	10.00
36"	lf	230	15.00	15.00
42"	lf	150	18.50	17.50
54"	lf	122	24.00	27.30
Pav bit ctd CM arch, integ base, 18"x11"	lf	114	7.00	7.50
22"x13"	lf	104	8.50	9.10
36"x22"	lf	108	17.00	16.90
43"x27"	lf	264	20.00	21.00
65"x40"	lf	76	45.00	35.00
Pavement				
Asph conc, tp A (85-100) surf crse	cy	4,396	17.00	17.00
leveling crse	cy	1,159	17.00	16.50
base crse	cy	4,853	17.00	17.00
Bit prime coat: MC-0 or MC-1; or RT-2 or RT-3	gls	26,239	0.30	0.30
Crushed agg base crse	cy	14,653	6.75	8.00
Subbase	cy	4,970	3.60	2.50

Completion Schedule: 5-14-57 to 12-31-57



EXCUSE OUR DETOURS

...as we fight the greatest safety crusade in history

1775-1956
1,098,393
Americans Died
in all the U.S. Wars

Revolutionary War	4,435
War of 1812	2,260
Mexican War	13,283
Civil War	497,332
Spanish American War	2,446
World War I	116,563
World War II	407,828
Korean War	54,246

1900-1956
1,220,000
Americans Died
in
U.S. HIGHWAY
ACCIDENTS

In 1955 alone, 1,350,000 people were injured in motor vehicle accidents. In World War I, World War II, and the Korean War combined the total of U.S. wounded was only 877,757! Source: Statistical Abstract of the United States

America's new Highway Program dwarfs any public works project ever attempted by man. Here is the assignment given your nation's contractors: (1) build 41,000 miles of super-highways; (2) renovate 700,000 miles of existing highways; (3) improve 2,500,000 miles of "back" roads.

To complete this gigantic mission as efficiently and quickly as possible . . . and to get the most out of your road-building dollars . . . it may be necessary, at times, to inconvenience you.

Temporary detours may send you roundabout . . . over routes that are longer, slower, rougher, and more congested.

Please be patient! Roadbuilding contractors . . . and highway departments for whom they work . . . will try sincerely to keep your inconveniences few and brief. Remember: your new highways will make travel more pleasant, less expensive. And the highway whose construction is troubling you most today, may someday save the life of one who is dear to you.

A Public Service for the
Roadbuilding Contractors of America
By LETOURNEAU-WESTINGHOUSE CO.
Builders of high-speed rubber-tired earthmoving equipment
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Co.

1579-MI-E

For You

this advertisement was run in a recent issue of U.S. News and World Report by LeTourneau-Westinghouse. Art work is available for use in your ads announcing opening of new jobs or for detour sign boards. Write us for reprints . . . and good luck to you for '58.

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Iron and Steel Products: Last, Oct. 17; Next, Nov. 14
- Wood Products, Glass, Explosives, Chemicals: Oct. 24; Next, Nov. 21
- Clay Products, Lime, Plaster, Paint, Roofing: Last Oct. 31; Next, Nov. 28
- Wage Rates, Building Board, Lath, Insulation: Last Oct. 31; Next, Nov. 28

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.* truckload del.* per block		CONCRETE Ready Mixed 1:2:4 del. 50 cy & over
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$4.31a	$3.90a	$3.57	$2.18	$2.28	$2.50‡	$2.18	$2.33	$1.55	$1.65	$0.175	$....	$13.75g
Baltimore	4.45c	4.05c	3.52c	2.80‡a	2.80‡a	2.25‡a	2.85‡a	2.90‡a	2.05‡a	2.00‡a	.18	.18a	12.95/13.45
Birmingham	4.08	3.15f	....	2.53n	2.53n	2.13n	2.75	2.75	1.55	1.65	.18	.18	12.55
Boston	5.75be	4.67a	4.79e	3.00a	3.00a	3.00a	1.75a	1.85a	....	....	.23	.275a	15.00h
Chicago	4.13a	3.72a	3.65/3.78	3.78‡b	3.78‡b	4.13‡b	3.95‡b	3.95‡b	2.25‡	2.25‡	.25	.25b	13.50
Cincinnati	4.46c	4.05c	4.03	2.29‡c	2.34‡c	2.34‡c	2.64‡c	2.64‡c	1.89	1.89	.19	.24a	13.25
Cleveland	N.A. in C.L.	....	3.88a	2.15ef	1.95f	1.65	4.50‡a	4.50‡a	3.35‡a	3.35‡a	....	.215	16.15
Dallas	3.55a	3.15a	3.43	2.60	2.65	1.90	2.43	2.63	....	....	....	.27	11.25
Denver	4.69a	4.19a	4.69	1.90	2.05	1.20	....	....	....	....	.22	.245a	10.70
Detroit	4.10a	3.60ag	3.73	4.50‡b	4.50‡b	4.25‡b	3.75‡	3.75‡	3.50‡	3.50‡	.23	.24a	14.20
Kansas City	4.45i	3.96a	4.25	....	....	1.70‡a	2.00‡a	2.00‡a	....	....	.23a	.26c	13.50
Los Angeles	5.12ch	4.68ch	5.60	2.56‡a	2.76‡a	2.41‡a	2.41‡a	2.46‡a	....	....	.14fm	.24m	12.96ih
Minneapolis	4.44a	4.04a	4.10	2.70‡ag	2.70‡ag	1.60‡ag	3.25‡ag	3.25‡ag	....	....	.19	....	14.30f
Montreal	3.21d	2.96d	3.60	1.95‡a	2.20‡a	2.25‡a	1.95‡i	2.20‡i	2.00	2.00	.20	.20a	10.80ek
New Orleans	3.75a	3.45a	3.70	2.44	2.44	2.00	....	....	1.45	1.65	.275	....	13.65
New York	4.83a	4.42a	3.72	3.20bk	3.20bk	2.30bk	3.10bl	3.10bl	....	....	.250n	.276b	17.40an
Philadelphia	4.57‡a	4.16‡a	3.61‡	2.85‡a	2.85‡a	2.35‡a	2.70‡	2.80‡	2.00	2.35	.25/.32	....	14.15do
Pittsburgh	5.50bjk	4.47bj	5.00bjl	2.60aq	2.60aq	3.00aq	2.00e	2.00e	2.10	2.10	.26	.28	15.55
St. Louis	4.01/4.33c	3.61/3.93c	3.86/4.18	3.25am	3.10am	2.40/3.10am	1.65j	1.75j	....	....	.24	.30c	12.40/12.90
San Francisco	3.94c	3.54c	4.38c	2.02	2.02	2.12	2.17	2.17	....	....	.24	.28cl	12.75c
Seattle	4.30a	3.75a	4.45a	4.00‡bm	4.00‡bm	4.00‡bm	4.50‡bm	4.50‡bm	....	....	.26	.37c	13.30j
Toronto	4.03	4.03	4.03	2.40‡	2.40‡	2.05‡	2.20	2.20	2.20	2.20	.25	.275c	15.25

‡ Delivered. * Prices incl. dealers discount except as noted.

CEMENT: *a Less 10¢ disc, 15 days. *b Less 2% disc, 15 days. *c Less 10¢ disc, 10 days. *d Truckload lots, deliv. 10¢ disc, 20 days. *e Truckload lots *f Fob mill, add 14.58 to $21.31 per car switching charges *g fob mill + freight *h LCL. *i Less 2% disc, 10 days *j Truck lots, fob yard *k 100 bag lots *l over 150 sacks

SAND GRAVEL, STONE & SLAG: *a Truck lots. *b Per cu. yd. *c 5 tons or more. *e ½". *f Pea gravel. *g Less 5% for cash. *h Less than 5 tons. *i Plus 5% mun. & prov. tax *j F.o.b. quarry. *k Barge lots asd. *l F.o.b. scow Hudson river. *m Less 2% for cash. *n F.o.b. cars. *q fob yard

CONCRETE BLOCK: *a Cinder *b Waylite. *c Haydite. *d Celocrete *e 5¼ x 8 x 12 in. *f 8 x 4 x 16. *g F.o.b. truck at job. *l F.o.b. plant San Rafael. *m F.o.b. yard. *n 8 x 8 x 18.

READY MIXED CONCRETE: *a 5 cu. yds. or over del. Man. *b 25 cu. yds or more *c 10-100 cy. brackets. *d 1-3 mi. zone. *e 2,000 lb comp. *f 2,500 lb. comp *g Less 25¢ disc, 15 days. *h Less 50¢ for cash. *i 5% off for cash. *j 2% off for cash. *k Federal tax included. Add 5% mun. & prov. *l 1:2½:3½. *m F.o.b. yard. *n Plus escalator clause. *o Add 15¢ for ea. add'l 1-mi zone.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10¢ per bbl. for payment within 15 days of date of invoice. Subject discount 10¢ per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 40¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$3.30†	Buffington, Ind	$3.25†	Steelton, Minn	$3.45†	Muskegon, Mich	$3.30†	Toledo, O	$3.30†
Clinchfield, Ga	3.30†	Independence, Kan	3.10†	Leeds, Ala	3.15†	Saginaw, Mich	3.30†	Milwaukee, Wis	3.35†
Kingsport, Tenn	3.30†	Hannibal, Mo	3.35†	Duluth, Minn	3.45†	Wyandotte, Mich	3.30†	Green Bay, Wis	3.35†
West Des Moines, Iowa	3.35†	Northampton, Pa	3.35†	Hudson, N. Y	3.35†	Buffalo, N. Y	3.40†	Ironton, O	3.30†
Nazareth, Pa	3.35†	Universal, Pa	3.45†	Alpena, Mich	3.20†	Oswego, N. Y	3.45†	Montreal City	2.56†
Bath, Pa	3.35†	Waco, Tex. (+ 10¢ tax)	3.35†	Detroit, Mich	3.30†	Cleveland, O	3.35†	W. Winfield, Pa	3.45†
Lesley, Pa	3.35†	Giant, S. C	3.35†	Howes Cave, N. Y	3.35†	Alsen, N, Y	3.35†	Security, Md	3.35†

† *Prices to hold for fourth quarter of* 1957.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 80-300 penetration		CUTBACK ASPHALT MC per ton		ROAD OIL Per gal.	ASPHALT EMULSION RSI Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	......	......	......	$30.50	$45.00	$0.15	$0.26	$0.125Pw	$0.28Pw	$0.14	$0.125	$0.30
Baltimore	150.00‡	......	......	23.00i	......	.095i	0.185i	.10iwE	.19iwE	.10i	.105i	0.195i
Birmingham	......	62.00i	......	......	......	......	......	......	......	......	......	......
Boston	......	......	......	24.00ap	46.00ap	24.00as	46.00as	.11aFw	.24aFw	.11ao	.174aGo	.25aGo
Chicago	150.00‡	90.00‡b	3.95/4.00‡j	24.25b	34.25b	21.40bv	31.40bv	.11bwH	.19bwH	.085b	......	......
Cincinnati	......	......	......	......	......	......	......	......	......	......	......	......
Cleveland	......	89.50d	6.30g	25.00A	......	25.00A	......	.1115AwF	......	......	.1115AG	.21AG
Dallas	e	40.00	e	26.35	45.39	.1116	.1944	29.80	51.40	.1080	.1116	.1994
Denver	......	56.00	......	......	......	......	......	......	......	......	......	......
Detroit	......	115.00	......	32.45	......	32.45v	......	.1361wI	......	.1133	......	.35
Kansas City	e	e	e	18.00cl	......	18.00v	......	.0925cwJ	......	.085c	0.125c	......
Los Angeles	e	......	e	21.00dvz	......	21.00dvz	......	22.50dzK	......	21.50dv	.097	.197
Minneapolis	......	......	3.73h	29.50	......	29.50	......	0.125w	......	0.115	.134	......
Montreal	e	e	e	32.50n	44.80n	.176n	.226n	18.70nuE	23.70nuE	.154n	.242ns	.27ns
New Orleans	......	......	......	20.00e	......o	20.00ev	......o	.095ew	......o	.085B	.095BL	......
New York	......	......	3.70f	26.89qCD	47.32qD	26.89stCD	47.32stD	.1273wCDF	.2139wDF	......	.1273CD	.2168D
Philadelphia	175/185	110/120	4.06	24.00	......	24.00	......	.11uF	......	.105	......	......
Pittsburgh	60.00k	99.12ln	6.35	28.30i	......	30.90iv	......	.1351i	......	.14‡	.1351i	......
St. Louis	......	......	......	22.90f	......	.1825	......	.1035fwM	......	0.165	.825	......
San Francisco	......	70.00c	......	23.00g	40.00g	23.00gkv	40.00gkv	24.00gN	41.50gN	23.75vg	.10y	.19y
Seattle	......	......	......	27.00z	40.50h	27.00s	......	28.50K	......	24.75hv	.10h	.11hr
Toronto	......	125.50	4.50	40.10	59.38	0.2004	0.2445	0.214w	0.258w	0.198	0.216	.271

‡ Delivered.

PAVING BRICK & BLOCK: *b 3 x 3¾ x 8. *c 2¼ x 8¼ x 4. *d LCL, truck deliveries. *e Not used. *f 2" interior 6# treat. *g 3" *h 2" tr, 8# *i 3 x 3⅝ x 8½. *j 2½", 6 lb. tr. *k Used. *l Redshale; clay $101.32. *m Pine; oak $6.57. *n Truck del.

ASPHALTS: *a Price at plant, Everett, Mass. *b F.o.b. refinery, Lockport, Ill. *c F.o.b. Sugar Creek, Mo. *d F.o.b. refinery, El Segunda. *e F.o.b. Baton Rouge. *f F.o.b. Wood River, Ill. *g F.o.b. Richmond, Calif. *h F.o.b. Martinez. *i F.o.b. refinery, Baltimore. *j F.o.b. refinery, Inglewood, Calif. *k 50-110 penetr. *l Less than 100 penetr. *m 40/80 penetr. *n Fed. tax included; add 5% for mun. & prov. *o Drums not avail. Shipped in steel bbl. *p 60/70 penetr. *q 40/300 penetr. *r In customer's drums. *s Shipped in drums, per drum. *t 85/300 penetr. *u Per 100 gal. *v Per ton. *w Per gal. *x Also tank trucks. *y F.o.b. Oakland. *z F.o.b Edmonds. *A F.o.b. refinery, Cleveland. *B F.o.b. Destrehan, La. *E RC. *F Also RC. *G Also MS, SS. *H RC 0-5 incl. *I MC 4. *J MC, RC $0.095 *K MC 3, 4 & 5. *L MS. *M MC 1-5, RC 1-5, $0.106. *N MC 3. *O Truckload. *P F.o.b. refinery Savannah: $0.09/gal., tank cars; $0.20/gal., drums. *Q F.o.b. Eldorado, Ark.

"Handle small street job or big, long haul job with ease"

. . . says Texas dirtmover

George O. Walker of Dallas, Texas, sub-contracted to rebuild 1½ miles of an old asphalt city street in Garland, Texas. The job called for excavating hard-packed asphalt and tough black gumbo to grade. To handle this earthmoving assignment, Walker brought in two LeTourneau-Westinghouse C Tournapulls, with Fullpak* scrapers.

Fullpaks load asphalt without ripper

The 2 big 18-yd. "C's" loaded fast in asphalt, without benefit of a ripper. Big (43" x 16"), low (36" center), push-block gave pusher quick, solid contact . . . carried thrust direct to blade for maximum cutting power. Low, wide bowl design helped get a heaped load fast. Dirt slid in almost horizontally from 9½' wide cut . . . rolled back to fill corners . . . helped Walker cut load time to move big yardages fast.

Spread waste on fills and vacant city lots

To find a waste area for excavated material proved no problem for sharp-turning "C's". Loads were spread rapidly on vacant lots or in low spots alongside the road. In spite of some narrow, restricted spread areas, operators maneuvered the 18-yd. "C's" easily, and maintained good production.

J. K. Masan, Walker's superintendent, says, "*'C' Fullpaks are fast . . . capable of handling a small street job or a big, long haul job with ease.*"

Operator R. F. Carter comments, "I have operated many similar machines, but this Model C is the best all-around dirtmover I ever sat on." Operator John Rooney adds: "I like the quick-release bowl . . . Model C can't be beat."

See Fullpaks in action

Why not let us arrange to show you a C Fullpak in operation on your type of work? We'll be glad to prove how Fullpak's fast loading, spreading, and hauling can mean bigger dirtmoving profits for you.

▲ C Fullpak's low, wide bowl design helps get a heaped load fast on this city street in Texas. Dirt slides in almost horizontally from a 9½' wide cut . . . rolls back to fill corners . . . heaps bowl with less engine hp applied to lifting, more to cutting.

▲ Rebuilding old street in Garland, Texas, 18-yd. C Fullpaks load fast in hard-packed asphalt without benefit of a ripper. Big, low push-block on "C" carries thrust direct to blade for maximum cutting power.

◀ Because of its 6'1" apron lift, plus positive ejection tailgate, C Fullpak spreads rock or chunky materials fast. Tournapull's speedy electric controls give operator choice of dumping load, or spreading it accurately to any desired depth.

Tournapull—Trademark Reg. U.S. Pat. Off.;
*Trademark CP-1387-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND.

BUILDINGS—BA

Mass., Boston—SCHOOL—BA 11/20—Harvard University, Medical School, 25 Shattuck St. (selected list bidders) medical school alterations, Bldg. "B", Shattuck St. $400,000. Shepley, Bulfinch, Richardson & Abbott, 1 Court St., archts. CD 9/20.

▲ **Mass., Marshfield**—SCHOOL—BA 11/21—Town, David Ellis, chn. Bldg. Comn., New St., Senior High School. $1,685,000. Plans deposit $100. Haldeman & Jacoby, 153 Main St., Brockton, archts. Bids Oct. 4 rejected. CD 10/10, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **Commonwealth of Mass., Metropolitan Dist. Comn.,** Constr. Div., 20 Somerset St., Boston, Mass., cancelled bids to have been opened Oct. 24, Contract 252, distribution lines from Shaft 9A-tunnel extension, incl. laying and connecting approx. 13,880 ft. pipe, Malden-Medford, Massachusetts. **$2,000,000.** CD 10/8.

BUILDINGS—LB & CA

▲ **Leo McManus Constr. Co., Inc.,** Shelter Rock Rd., Danbury, Conn., CA **$1,000,000,** 50,000 sq. ft., steel and mortar PLANT, for mfg. magnetic tape, Great Pasture Rd., DANBURY, CONN. Reeves Soundcraft Corp., 10 E. 52 St., New York, N. Y. Awarded Oct. 22. CD 10/24.

Town, Town Hall, rejected bids July 7, Junior-Senior HIGH SCHOOL, Route 207, LEBANON, CONN. LB **$516,800.** CD 8/1, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† **Pennsylvania**—BA 11/15—U. S. Eng., 24 St. and Maryland Ave., Baltimore 3, Md. 1700 lin. ft. earth fill dam, 500 lin. ft. adjacent dike, 346 lin. ft. of conduit a slide type gate, 264 lin. ft. ogee type side channel concrete spillway 2 access bridges and clearing and grubbing 96 acres of reservoir area, Stillwater Reservoir and dam, $5,000,000-$10,000,000; constr. conventional type of filter plant (cap. 750 gal. per min.) with misc. piping and machinery incl. heating, plumbing and electrical work at Forest City four mi. below Stillwater reservoir and dam, $100,000-$500,000. CD 9/10.

† **Pennsylvania**—BA 12/19—U. S. Eng., 2635 Abbottsford Ave., Phila., relocating approx. 700 graves at two cemeteries and incidental roadway and utility work at Dyberry Reservoir $100,000-$500,000. CD 9/11.

† **Pennsylvania**—BA 1/21—U. S. Eng., 2635 Abbottsford Ave., Phila., relocating 3.8 mi. roadway Prompton Reservoir. $500,000-$1,000,000. CD 9/5.

▲† **New York and New Jersey**—BA About 2/20—U. S. Eng., 111 E. 16 St., New York 3, N. Y., removing, disposing 119,000 cu. yd. all material lying above the plane of 37 ft. below M. L. W. of which 71,000 cu. yd. are ledge rock and 48,000 cu. yd. are other material, New York and New Jersey Channels, Hard Rock, Area 15, $1,000,000-$5,000,000. CD 9/9.

HEAVY CONSTRUCTION—LB & CA

▲ **J. D. Posillico, Inc.,** 174 Fulton St., Farmingdale, N. Y. LB **$559,947.** (8 bidders) imprv. Old Court House Rd. from North Hempstead Turnpike, southerly 5,450 plus or minus ft. by constr. bit. macad. pavement, concrete curbs and sidewalk, storm water drainage and installing water mains incorporated Village of North Hills and vicinity Town of North Hempstead 5,450 plus or minus ft., MINEOLA, N. Y. Comr. P. Wks., Nassau Co., Old County Court House, Mineola, N. Y. Bids Oct. 23. CD 2/21/55;
William H. Greene, Grand Blvd., Westbury, N. Y. LB **$473,700.** (11 bidders) imprv. Carman Ave. from Hempstead-Farmingdale Turnpike, northerly to Point approx. 250 ft. north of Choir Lane vicinity of East Meadow, Town of Hempstead by paving curbs, sidewalk and drainage 10,200 plus or minus ft., Contr. 1004-C (Mineola, N. Y.).

BUILDINGS—LB & CA

Joel Kligman, 206 Middstream Rd., Point Pleasant, N. J. Own Forces. **$525,000.** 35 addnl. HOUSES at Arrowhead Village Development on Route 70, POINT PLEASANT, N. J. Louis Steuber, 2092 Morris Ave., Union, N. J., archt.

▲ **James Hochbarth,** Box 56, Raritan, N. J., Own Forces. **$1,375,000.** 93 HOMES on new tract to be known as Brookfield Homes on Old Yorke Rd., RARITAN, N. J. Robert J. Cadien, 570 Gorge Rd., Cliffside Park, N. J. and Harsen & Johns, Piedmont Rd. and Summit St., Tenafly, N. J., archts.

▲ **Arthur Kahn & Jos French,** 55 Plane St., Newark, N. J., Own Forces. **$1,600,000.** 53 HOUSES, Swimming River Rd., as a new Royal Garden Estates, RED BANK, N. J. Isadire Naftali, 312 High St., Newark, N. J., archt.

Prime Constr. Co., 347 Market St., Paterson, N. J., Own Forces. **$500,000.** 20 addnl. HOMES, new section of The Oaks on Aspen Rd., WEST ORANGE, N. J. Roche & Roche, 234 W. 44 St., New York, N. Y., archts.

▲ **Merandy, Inc.,** 4098 Minn. Ave. N.E., Wash., D. C. LB **$1,719,409.** (8 bidders), Sligo JUNIOR HIGH SCHOOL, Silver Spring, ROCKVILLE, MD. Montgomery Co. Bd. Educ., Rockville, Md. Bids Oct. 24. CD 9/27.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **Blythe Bros.,** 2911 Hutchinson, Charlotte, N. C., CA **$387,000,** reservoir, HIGH POINT, N. C. City, City Hall, High Point, N. C. Grand total $1,028,629 Bids Sept. 25. CD 9/6;
T. A. Loving Co., Durham, N. C., CA **$316,487,** 24 in. water main, CA **$325,142** outfall Ensley, (High Point, N. C.).

F. L. Showalter & Co., 2900 Fulks St., Lynchburg, Va., CA **$631,734,** West Side Sewage Plant, HIGH POINT, N. C. City, City Hall, High Point, N. C. Bids Sept. 25, CD 9/6, under Water Supply.

BUILDINGS—LB & CA

Barber Contg. Co., Box 270, Moultrie, Ga., CA **$500,000,** COURT HOUSE, AMERICUS, GA. Bd. Comrs, Sumter Co. Court House, Americus, Ga., Bids Oct. 9. CD 10/21, under LB.

▲† **Blaw Knox Co.,** 600 6th Ave., Pittsburgh, Zone 22, Pa., CA **$3,500,000,** four 150,000 kw STEAM UNITS, for Johnsville Power plant, JOHNSVILLE, TENN. Tennessee Valley Auth., New Sprankles Bldg., Knoxville, Tenn.

MIDDLE WEST

BUILDINGS—BA

O., Toledo—HOUSING—BA 11/19—Toledo Metropolitan Housing Auth., 400 Nebraska St., 50-unit, 1 story, brick veneer housing for aged to be known as A Gorden Spieker Terrace, 10 dwelling bldgs. and community center. $588,881. Munger & Munger Assocs., National Bank Bldg., archts. CD 8/8/56.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

▲ **Ill., Chicago**—HOUSING—BA 12/3—Chicago Housing Auth., 608 S. Dearborn St., constr. housing, two 10 story elevator bldgs., four 13 story bldgs., community center, management and maintenance boiler plant, utilities and site imprvs. bounded by Western Ave. on East, Congress St. on South, Rockwell Ave. on West, and Madison St. on North, known as Rockwell Gardens, Proj. Ill. 2-21. Plans deposit $75. Nicol & Nicol, 23 East Jackson Blvd., Zone 4, archts. CD 8/9/54.

▲ **Ill., Granite City**—HOSPITAL—BA 2/4—St. Elizabeth's Hospital, Sisters of Divine Providence, 2100 Madison Ave., 6 story, brick, steel, concrete, etc. wing addn. and complete remodeling of present hospital facilities. $2,250,000. Gabriel & Dulgeroff, 1839A Delmar St., archts. CD 4/22.

HEAVY CONSTRUCTION—LB & CA

▲ **City, Dpt. Port Control,** Wm. J. Rogers, Dir., City Hall, Cleveland 14, O., cancelled bids to have been opened Oct. 10, dock, W. 6th St., CLEVELAND, O. **$1,500,000.** CD 9/25.

ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,
Industrial Constr. Co., 20 N. Wacker Dr., Chicago 6, Ill., CA **$553,880,** erecting steel and furnish, install light sys. for 13 span bridge on F.A. No. 178 LaSalle Co. Bids Oct. 8, awarded Oct. 21. CD 10/11, under LB.

▲ **WISCONSIN**—State Hy. Comn., State Office Bldg., Madison, Bids opened 10/22,
Wis.—**Raemisch Constr. Co.,** Middleton, Wis., LB **$202,398** (4 bidders) grade, base 2.216 mi. and structure B-53 22, 23 and 24, the South County Line-S.T.H. 81 Road, Proj. S 1009 (1), Town Road, Contr. 1, Rock Co.;
Wis.—**James Peterson & Sons, and Kluck Constr. Co.,** Medford, Wis., LB **$511,925** (9 bidders) grade and subbase and structures, 2.793 mi. The Hudson-Eau Claire, Knapp-Menomonie Section Road, Proj. I 103-4 (7), Interstate Route 103, Contr. 1, Dunn Co.;
Wis.—**P. C. Kaiser Constr. Co.,** Portage, Wis., LB **$356,133,** (16 bidders) grade and subbase and structure 2.289 mi. on The Hudson-Eau Claire, Knapp-Menomonie Section Road, Proj. I 103-4(7), Interstate Route 103, Contr. 2. Dunn Co.;
Wis.—**The Druml Co.,** 1788 N. Water St., Milwaukee, Wis., LB **$404,478,** (5 bidders) grade, base and conc. 0.890 mi. The Racine-S.T.H. 31, (Horlicksville Bridge approaches), Road, Proj. F 074-1(4) S. T. Hy. 38, Contr. 2, Racine Co.;
Wis.—**H. Turner & Son,** Boscobel, Wis., LB **$147,979,** (10 bidders) b. conc. 7.643 mi. The Green Lake Station-Berlin Road, and Church Street, City of Berlin, Proj. F 072-2 (6) and T 072-2(5), S. T. Hy. 49, Green Lake Co. CD 10/4.

BUILDINGS—LB & CA

I. Bush & Son, 4204 S. Brook St., Louisville, Ky., CA **$614,273,** JUNIOR HIGH SCHOOL and GYMNASIUM, MILAN, IND., Milan School Bldg. Corp., Milan, Ind. Bids Oct. 8, awarded Oct. 16. CD 10/14, under LB.

B. W. Handler Constr. Co., 223 W. Jackson Blvd., Chicago, Ill., LB **$974,603.** 81-unit, 8 story APARTMENT, 5701 S. Drexel Blvd., CHICAGO, ILL. University of Chicago, Midway and Woodlawn Sts., Chicago, Ill. Bids Oct. 17. CD 9/24.

Young & Sons, 1244 E. 79 St., Chicago, Ill., CA **$772,000.** 2 story, brick GRADE SCHOOL, 6006 S. Peoria St., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Burnham & Hammond, 53 W. Jackson Blvd., Chicago, Ill., archts. CD 6/11.

▲ **The Austin Co.,** 510 N. Dearborn St., Chicago, Ill., CA Est. **$1,000,000,** 2 story, bsmnt., brick, concrete DEPARTMENT STORE and altering SERVICE BLDG., Barstow, Main and Graham Sts., EAU CLAIRE, WIS. Montgomery Ward Co., 113 E. Grand Ave., Eau Claire, Wis.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—LB & CA

IOWA—State Hy. Comn., Ames,
S. E. Gustafson Constr. Co., Sioux Falls, S. D., CA **$917,892,** grading 4.348 mi. Interstate Route 2 from point near W¼ corner Sec. 13-79-25 easterly to point near center Sec. 15-79-24, I-IC-02-3(2), Polk Co. CD 10/22, under LB.

BUILDINGS—LB & CA

Calhoun Co., Courthouse, Port Lavaca, Tex., rejected bids Oct. 16, COURTHOUSE-JAIL, PORT LAVACA, TEX. LB **$615,000.** CD 10/23, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

Calif., Los Angeles—BA 11/15—Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Storm Drain Bond Issue Proj. No. 43, Bundy Dr. and Bowling Green Way.

(Continued on page 135)

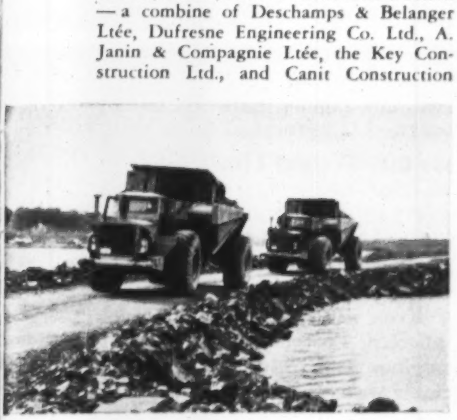
8 Rear-Dumps, working on St. Lawrence Seaway lock at Côte Ste. Catherine, carry 33 to 38 tons of shot rock. In earth overburden weighed loads averaged 34.4 tons.

35-ton Rear-Dumps "move maximum loads in minimum time"

on St. Lawrence Seaway

Building the St. Lawrence Seaway, connecting the Great Lakes and the Atlantic Ocean for sea-going vessels, has presented many tough obstacles to the contractors' construction crews, both in Canada and the United States.

Excellent progress has been achieved at Lock Côte Ste. Catherine, across the river from Montreal. This project, too, has been troubled — by weather, icing, lighting problems involved in day-and-night operation, and by the many difficulties inherent in day-to-day problems of a marine construction job. In spite of these factors, Canamount & Canit Construction — a combine of Deschamps & Belanger Ltée, Dufresne Engineering Co. Ltd., A. Janin & Compagnie Ltée, the Key Construction Ltd., and Canit Construction Ltd. — is working successfully on its contract with the St. Lawrence Seaway Authority of Canada. Time schedule has been accomplished satisfactorily although the project is a demanding one.



The lock, turning basin, and related dikes involve the excavation of more than 4½ million cubic yards of earth overburden, and shale-rock — plus the placing of 350,000 yards of concrete.

Excavate below water line

Some excavation is below water level, so cofferdams had to be built, and the areas pumped dry, before work could begin. During the winter of '55-'56, with earthmoving progressing well in the pit behind the cofferdams, slabs of floe ice from the river catapulted over the embankment and into the pit. Removal of the ice was an added expense and delay. In spite of difficulties like this, the job proceeded ahead of schedule.

Maintains roads for best production

Making a major contribution to moving overburden at a faster-than-scheduled rate, are eight 35-ton Model B Tournapull® Rear-Dumps with 27 yards heaped capacity. Says Project Manager M. Kazanovitch, "They move maximum loads in a minimum of time."

He is a firm believer in steady, *consistent* production rather than speed records, and has equipped all haul units on the project with governors set at 20 to 25 mph. Although his "B's" with top speed rating of 34.4 mph are cut back approximately one-third, they regularly complete excavation haul cycles in 10.58 minutes over a one-way distance of 4700 ft. A 550 Adams motor grader constantly maintains haul roads, so equipment can always travel at its top governed speed.

Efficient in small space

For all their size (35'10" long), electric-control B Tournapulls can turn around non-stop in just 35' (only 27' in dump position). This is far less space than that required by any other hauler of comparable size. The Superintendent says, "Ability to maneuver in spaces is a great feature of this machine."

90% to 95% mechanically efficient

Because of methodical servicing and quick attention to minor repairs, the 8 Tournapull Rear-Dumps have maintained performance at 90% to 95% mechanical efficiency. Superintendent Kazanovitch believes that the "negligible amount of layup time" has also been important to the job's progress.

If you handle BIG yardage earthmoving, you'll want to know more about big B Rear-Dump . . . how it can speed *your* work . . . cut *your* costs. Write us for more information

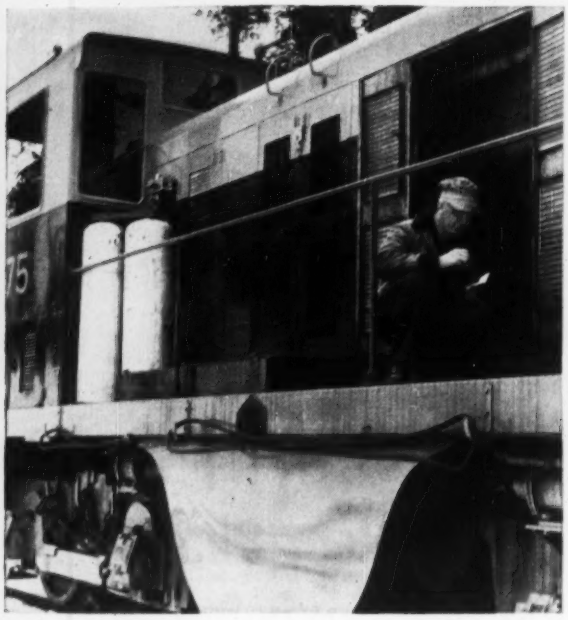
Adams—Trademark BRAG-1131-D-b-5

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

A single drop of used oil from this truck indicates true condition of the vehicle's oil . . . and tells a lot about the engine's operation.



Daily oil checks assure maximum lubrication efficiency in this diesel locomotive.

Now—they're testing used oil in minutes

THE NEED for a fast, accurate and practical method for determining the condition of used oil has long been one of the more serious problems confronting fleet operators. It's obviously wasteful to discard still-good oil, but operating a vehicle with contaminated oil could lead to costly engine damage. This was an unsolvable condition which maintenance men had come to accept.

Since no two vehicles, even of the same make and model, are identical in performance or operation, maintenance men were compelled to compromise on oil change "averages" recommended by engine manufacturers. This procedure is uncertain and costly. Fortunately, this operating conflict has been resolved with the introduction of a simple but completely reliable oil check system . . . the Shell ADC Oilprint Analysis.

The ADC Analysis was primarily conceived to determine proper oil change intervals for individual engines. However, it goes much further. It is capable of actually reducing engine maintenance costs by disclosing certain mechanical defects *before* they have caused serious engine damage.

The test procedure is very simple . . . requires little practice to perfect . . . and provides a reliable check of oil from merely two drops of used oil. In minutes, the degree of *A*lkalinity, *D*ispersancy and *C*ontamination can be determined easily.

Here are several typical examples from various areas of the country. They show how fleet operators, employing both diesel and gasoline engines, have successfully and profitably applied the ADC program.

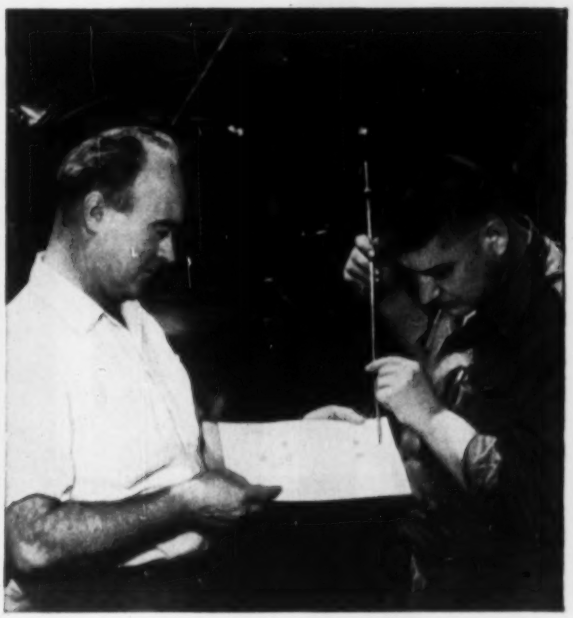
A Kansas City Freight Line

Operating a large fleet of trucks, one Kansas City freight line previously had drained and replaced oil every 3,000 miles. After adopting the ADC-Oilprint Analysis, individual test charts showed that, in most cases, drainage would not be necessary at less than 6,000-mile intervals. Even at this doubled interval, engine life was not affected. Further proof was established when these engines were inspected at 87,000 miles and no appreciable wear was found on bearings, pistons, rings or valves.

An Idaho Logging Operation

Oil had previously been drained after a limited number of hours of use on an Idaho company's diesel locomo-

Substantial oil economy is realized in this tractor, because oil is changed only when indicated by the Oilprint.



Taking a quick "fingerprint" of crankcase oil from an interstate carrier.

tives. With the ADC Oilprint Analysis as a guide, the oil-change interval has now been safely increased manyfold. The savings made possible by this on-the-spot test in oil, filter change and labor costs were considerable. Furthermore, leaky head gaskets are frequently discovered before any serious engine trouble develops. Here is another valuable plus for the ADC Oilprint Analysis.

A Washington, D.C., Transit Company

This transit company operates a large fleet of buses with both gasoline and diesel engines in use. With the difference in operating schedules . . . rush hours, short and long hauls, around-the-clock schedules . . . both engine types were believed to require complete oil changes every 2,000 miles. When the ADC program was instituted, the tests showed that oil-drain periods and minor maintenance checks could be safely extended to every 3,000 miles for gasoline engines and 4,000 miles for diesel engines.

Fleet operators, who are concerned with extending the service of crankcase oil and avoiding the risk of using contaminated oil, are invited to sit in while a Shell service engineer demonstrates the time-and-money advantages of an ADC Oilprint Analysis program.

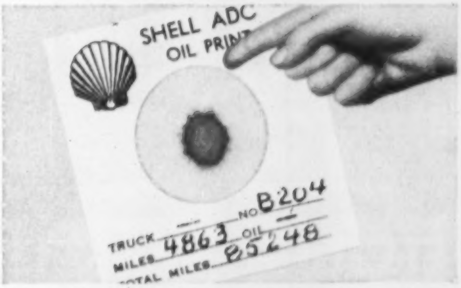


Photo shows an oil-spot test card . . . one phase in the visual life record of a change of oil.

One drop of a special indicator* fluid developed by Shell checks the alkaline reserve in the oil.

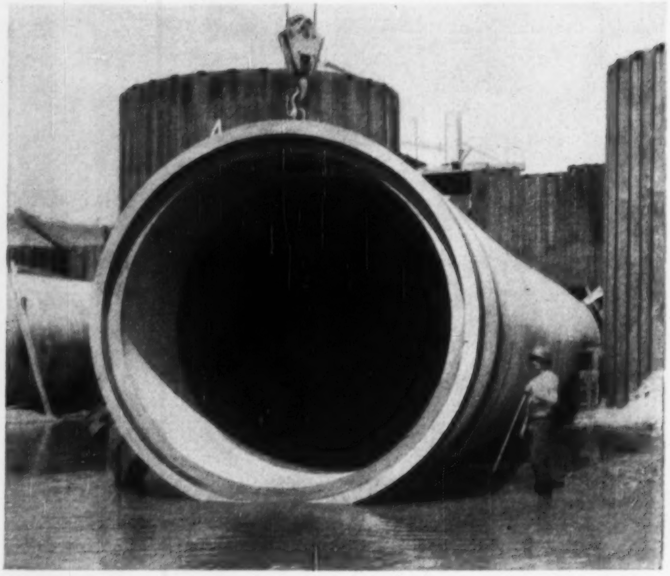
*Indicator Fluid U.S. Patent No. 2,770,530

SHELL OIL COMPANY

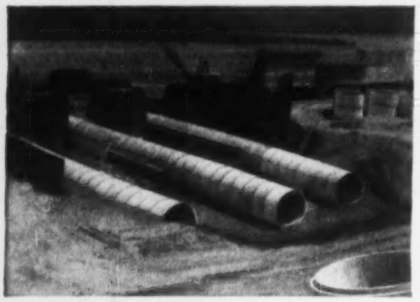
50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

BIG



CONCRETE PIPE BY AMERICAN-MARIETTA



American-Marietta 144" reinforced concrete pipe installation used by Ohio Edison Co. for a triple discharge line over 1000 feet long at Stratton, Ohio.

A-M trucks delivering concrete pipe directly to the job site. Nationwide location of plants assures quick delivery of your order by truck, rail or barge.

Another example of PROGRESS IN CONCRETE

BIG diameter reinforced concrete pipe—delivered to the job in quantity—calls for a manufacturer with BIG facilities. American-Marietta not only has the necessary equipment and engineering background to produce such pipe in quantity, but the ability to deliver it *when* and *where* needed from any of its many plants located strategically from coast to coast.

So if you're thinking BIG—about a BIG job with BIG savings in time and money—think of AMERICAN-MARIETTA COMPANY.

Our technical staff will be pleased to assist you with your pipe problems.

AMERICAN-MARIETTA COMPANY
CONCRETE PRODUCTS DIVISION
GENERAL OFFICES:
AMERICAN-MARIETTA BUILDING
101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS, PHONE: WHITEHALL 4-5600

(Continued from page 130)

Storm Drain, $914,300. Plans deposit $2.60. CD 11/7/52.

† **Ariz., Fort Huachuca**—UTILITY SYSTEM—BA 11/19—U. S. Eng., 751 E. Figueroa St., Los Angeles, Calif., roads and utilities, ENG-04-353-58-10. **$650,000.** Extended date. CD 8/12.

BUILDINGS—BA

Calif., San Francisco—CLINIC—BA 11/19—State Div. Architecture, Pub. Wks. Bldg., 1120 N. St., Sacramento, 4 story, rein.-con. structural steel, 29,000 sq. ft. clinic addns. at Langley Porter Clinic. **$684,000.** Plans deposit $50. CD 12/31.

▲ **Calif., Los Angeles**—OFFICE—BA 11/20—State Div. Architecture, 1100 S. Grand Ave., 9 story, penthouse and bsmnt. 500,000 sq. ft., structural steel and metal decking for State Office Bldg. No. 2. $1,605,500. Plans deposit $25. CD 5/18/56.

HEAVY CONSTRUCTION—LB & CA

Emil H. Krall, P.O. Box 1548, Yuma, Ariz. CA **$706,900.** sewage disposal plant, appurtenances, EL CENTRO, CALIF. City Council, City Hall, El Centro, Calif. Bids Sept. 26, awarded Oct. 2. CD 10/9, under LB.

Milosevich & Zarubica, 1419 Potrero St., El Monte, Calif. CA **$498,819** (8 bidders) addnl. sewage disposal facilities, Sch. A trunk sewer, LAGUNA, BEACH, CALIF. City, City Hall, Laguna Beach, Calif. Bids Sept. 18. Grand total $926,681. CD 8/19;
Griswold Constr. Co., 9415 Cortada St., El Monte, Calif. CA **$318,922.** (4 bidders) addnl. sewage facilities, Sched. D.-3, outfall sewer 3,000 ft. submarine, (Laguna Beach, Calif.);
James F. Hoagland, 3254 Cherry Ave., Long Beach, Calif. CA **$108,940.** (4 bidders), addnl. sewage disposal facilities, Sched. B sewage treatment plant (Laguna Beach, Calif.).

Goudeseune, Cowan & Besselinck, P.O. Box 458, Westminster, Calif. LB **$935,087.** (9 bidders) Storm Drain Bond Issue Proj. No. 9, Unit 1, Line F; Los Cerritos Storm Drain and portion Storm Drain, Proj. No. 133, Long Beach, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Oct. 11. CD 9/13.

BUILDINGS—LB & CA

Contracting Engrs., 2310 W. Vernon Ave., Los Angeles, Calif. CA **$500,000.** 4 story, Beverly Crest HOTEL, 125 Spaulding Dr., BEVERLY HILLS, CALIF. Joseph Bulaski, 125 S. Spaulding Dr., Beverly Hills, Calif.

Taylor & Clark, 10691 Magnolia Ave., Arlington, Calif. CA **$576,404.** (8 bidders) 39,832 sq. ft. frame, stucco Hobsonway ELEMENTARY SCHOOL and addns. to Enterprise and Ripley ELEMENTARY SCHOOLS, BLYTHE, CALIF. Palos Verdes Unified School Dist., Blythe, Calif. Bids Oct. 11, awarded Oct. 15. CD 9/17.

Leon Slavin, 470 S. San Vicente Blvd., Los Angeles, Calif. CA **$504,490.** (8 bidders), Pioneer SCHOOL, COVINA, CALIF. Covina School Dist., 17850 E. Rowland Ave., Covina, Calif. H. L. Gogerty, 3123 W. 8th St., Los Angeles, Calif., archt. Bids Oct. 7.

▲ **William J. Moran Co.,** 1011 S. Fremont, Alhambra, Calif. CA **$1,300,000.** 170,400 sq. ft. Type I&II Bldgs., SHOPPING CENTER, POMONA, CALIF. Jack Singer, c/o Underhill & Wagner, archts., 4313 Leimert Blvd., Los Angeles, Calif. CD 3/18/55.

CANADA

BUILDINGS—LB & CA

Rush & Tompkins (Canada) Ltd., 10023-103rd St., Edmonton, Alta., CA **$450,000,** 2 story, 53x150 ft., rein. con. OFFICE BLDG., EDMONTON, ALTA. Credit Foncier Franco-Canadien, Edmonton, Alta. Awarded Oct. 16. CD 1/14.

C. T. Lount Constr. Co. Ltd., 10 McGillivray St., Winnipeg, Man., CA **$672,000,** erect 12 two story frame, stucco bldgs., containing 88 HOUSE UNITS, Troy St., west of McPhillips Ave., WINNIPEG, MAN. Chamberlain Development Ltd., c/o 10 McGillivray St., Winnipeg, Man. Awarded Oct. 15.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **Williams Brothers Sud America Ltd.,** (Williams Bros. Constr. Co., 3311 Montrose Blvd., Houston 6, Tex., U.S.A.), Caracas, Venezuela, CA **$8,700,000,** 71 mi. 30 in. crude oil pipe line between Oficina and Puerto LaCruz in eastern VENEZUELA. Mene Grande Oil Co., Oveja, Venezuela. CD 9/10/56.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—LB & CA

▲ **E. E. Black Ltd.,** Honolulu, Hawaii, CA **$3,845,352.** second Koolau Mountain Tunnel, HONOLULU, T.H. City-County Govt., Honolulu, T.H. Bids Oct. 17. CD 9/12.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., Ramona**—Municipal, Water Dist., water sys., **$1,752,842.** Bids soon.

▲ **Mich., Cadillac**—City, Emil F. Meyer, clk., water sys. imprvs. **$1,200,000.**

▲ **Mich., Mt. Clemens**—City, Fred Soule, clk., modernize and expand mains, storage facilities, etc. **$1,000,000.** CD 11/10/53.

SEWERS, WASTE DISPOSAL

▲ **Calif., Stockton**—City, c/o Clerk, City Hall, voted bonds Oct. 8, sanitary sewerage system, **$2,144,000.** CD 8/15, under Public Bldgs.

▲ **Ill., Chicago**—City, City Hall, auxiliary outlet sewers, South side sys., Archer Ave., Normal Ave., 29th St., 30th St., 37th St., Emeral and Parnell Aves., **$2,000,000;** auxiliary outlet sewers, Wrightwood Ave. sys., Wrightwood, Long, Menard, Mayor and Melvina Streets, **$1,800,000;** auxiliary outlet sewers in Central south side sys., Contr. 1-H, **$800,000.** CD 3/19/45.

▲ **Mo., St. Joseph**—Bd. P. Wks., City Hall, postponed **$6,500,000** Nov. 12 bond election, sewerage system and imprvs., incl. treatment plant, interceptor sewers and main sewer extens. New bond election after Jan. 1, 1958. CD 9/27.

▲ **Utah, Logan**—City Comn., City Hall, defeated bonds Oct. 8 sewerage system. **$1,000,000.** CD 9/24.

BRIDGES

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul,
Minneapolis—new traffic bridge over Mississippi River upstream 300 to 600 ft. from existing Tenth Ave. S.E. bridge (part of proposed Minneapolis Freeway Sys.). **$2,000,000.** Constr. about 1960. A. E. LaBonte, c/o owner, bridge engr. CD 12/1/43.

▲ **Okla., Oklahoma City**—Oklahoma Co., Court House, voted bonds Oct. 15, county bridges. **$6,000,000.** W. N. Dale, Court House, co. engr. CD 8/28.

STREETS AND ROADS

▲ **Calif., Stockton**—City, City Hall, voted bonds Oct. 8, street imprvs. and flood control. **$6,702,000.** CD 8/15.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Agawam—Rte. 5 to Main St., **$1,750,000.**
Hingham—final section southeast Expressway, **$2,000,000.**
Longmeadow—interstate hy., **$3,000,000.**
Methuen—Rte. 113 to Marston's Corner, first sect., **$1,200,000.** Perley F. Gilbert Assoc., Sun Bldg., Lowell, engrs. CD 10/10/56.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
North Adams—Rte. 2 by-pass thru center of city, **$1,500,000.**
Wendell and Orange—hy. constr. Rte. 2, **$1,300,000.**

▲ **RHODE ISLAND**—State R. I. & Prov. Plants, Div. Purchase, State House, Providence,
West Warwick—rebuilding highway and bridge over railroad near Washington St., rebuilding Centreville Rd. and Legris Ave. **$1,000,000.** Constr. in 1958.

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EARTHWORK, WATERWAYS

▲† **California**—U. S. Eng., 751 S. Figueroa St., Los Angeles. Los Angeles County Drainage Area, **$18,000,000** appropriated for

Burbank Western Sys., Part No. 1 (upper) SPRR to Burbank Blvd.
Big Dalton Wash., Part No. 1, Walnut Creek Channel to Los Angeles Ct.
Big Dalton Wash, Part No. 2, Los Angeles St. to Lark Ellen Ave.
Sawtelle-Westwood, Part No. 5, Pico Blvd. to National Blvd. on Westwood Branch and Pearl St. to Woodbine St. on Sawtelle Branch
Santa Anita Wash, Part No. 1, Santa Anita Wash to AT & S.F. R.R.
San Diemas Wash, Part 1, Lark Ellent St. to Grand Ave.
Rubio Canyon Diversion ,complete from debris basin to Eaton Wash Channel
Part No. 2 (upper), Valley Blvd. to Lower Azusa Rd., Los Angles County Drainage area, Rio Hondo Channel. Bids about Jan. 2, 1958. CD 9/10.

▲ **California**—Southern California Edison Co., 601 W. 5th, Los Angeles, dam, power house and water storage reservoir on Upper San Jaquin River, Mammoth Pool Dam, 60 mile N. W. of Fresno, **$49,600,000.**

▲ **Mich., Pontiac**—City, Walter K. Willman, mgr., constr. Flood Control Proj., 3,300 ft. giant conduits Clinton River, incl. constr. dam at Osmun Lake; imprv. river channel between Osmun and Terry Lakes on Pontiac Creek. **$8,273,000.** Jones, Henry & Williams, Security Bldg., Toledo, O., consult. engrs. Bid in separate segments.

AIRPORTS

▲ **Man., Fort Churchill**—AIRPORT IMPROVEMENTS—Defence Constr. (1951) Ltd., 56 Lyons St., Ottawa, Ont., constr. (a) hydrant refueling installation about **$2,500,000** (b) various bldgs. and (c) services associated with (a) and (b), **$2,000,000.** CD 8/29.

PUBLIC BUILDINGS

▲ **Calif., Corning**—HIGH SCHOOL—Corning Union H.S. Dist. plans by Harold Gimeno, 1400 No. Sycamore St., Santa Ana, high school. **$1,000,000.**

▲ **Calif., Redwood City**—SCHOOLS—Sequoia Union High School Dist., "D" St., Broadway and El Camino Real, defeated **$3,975,000** bonds Oct. 15, school building program. CD 7/17.

▲ **Calif., San Mateo**—COLLEGE addns.—San Mateo Junior College Dist., Coyote Point, voted $5,900,000 bonds Oct. 15, for school bldgs. at Southern Campus and site purchase for Northern Campus, **$9,500,000.** Warnecke & Warnecke, 507 Howard St., San Francisco, archts. CD 8/16.

▲ **Calif., Stockton**—LIBRARY—City, City Hall, defeated bonds Oct. 8, library **$1,981,000.** CD 8/15.

▲ **Colo., Boulder**—HIGH SCHOOL—School Dist. No. 3, 1440 Walnut St., $2,211,000 bond election Nov. 26, Junior High School, **$773,000.** Robert W. Ditzen, 1135 Pearl St., archt.

▲ **Conn., Bridgeport**—SCHOOL—Town of Bridgeport, plans by J. Gerald Phelan, 211 State St., North End Elementary School, Reservoir Ave. **$1,500,000.** CD 10/21.

▲ **Conn., Stamford**—HIGH SCHOOL—Bd. Educ., 151 Broad St., plans by Urbahn, Brayson & Burrows, 654 Madison Ave., New York 21, N. Y., high school. **$4,000,000.** CD 9/27.

▲ **Mass., Braintree**—POWER PLANT—Town, Electric Light Dpt., 44 Allen St., power plant, Fore River, East Braintree. **$3,600,000.** Gilbert Assoc., Inc., 607 Washington St., Reading, Pa., engrs. Bids about Nov. 15. CD 6/24/51.

▲ **Mich., Lincoln Park**—SCHOOLS, etc.—Bd. Educ., 1300 Champlain St., plans by Eberle M. Smith & Assoc., 153 E. Elizabeth St., Detroit, 2 story, rein.-con. high school addn., incl. swimming pool. **$2,000,000.** plans by Robert J. West, 1214 United Art Bldg., Detroit, Junior High School addn. **$2,000,000.** CD 7/9.

▲ **Mich., Madison Heights**—SCHOOL—City, F. Foster Willims, supt. Schools, bond election Nov. 18, high school, 11-Mile Rd. **$1,665,000.** George D. Mason & Co., 409 Griswold, Detroit, archts. CD 7/24.

▲ **Minn., Little Falls**—SCHOOL—Bd. Educ., R. E. Smith, clk., plans by F. W. Jackson & Assocs., St. Cloud, Senior High School. **$1,250,000.**

▲ **Mo., Normandy (St. Louis, 21, P. O.)**—SCHOOL etc.—Normandy School Dist., Bd. Educ., Herman C. Bleckschmidt, asst. supt. Schools, 7837 Natural Bridge Rd., voted **$1,300,000** bonds Oct. 15, Senior High School addns. and Garfield, Lincoln, Harrison and McKinley Elementary Schools. CD 10/14.

▲ **Mo., Springfield**—POWER PLANT—City Utilities of Springfield, c/o E. W. Belt, purch. agt., voted **$8,487,000** bonds Oct. 14 for 22,000 kw unit (third unit) power plant. Burns & McDonnell Eng. Co., 95 and Troost, Box 7088, Kansas City, Mo., consult. engr. CD 9/27.

▲ **Neb., Omaha**—GENERATING UNIT—Omaha Pub. Power Dist., 17th and Harney Sts., fourth generating unit at North Omaha Power Plant. **$2,000,000.** Pioneer Service & Eng. Co., 231 S. LaSalle St., Chicago, Ill., consult. engr.

▲ **New York**—SCHOOL—Bd. Educ., 49 Flatbush Ave., Brooklyn, N. Y., plans by Michael L. Radoslovich, c/o owner, Proj. E-419, Junior High School No. 49, Forest Ave. and Clone Rd. Richmond Co. **$3,600,000.** Constr. 1958. CD 1/13/44.

▲ **N. Y., Greenlawn**—SCHOOL—Bd. Educ., plans by Ketchum, Gina & Sharp, 227 E. 44 St., New York, Zone 17, Harborfields Central High School. **$2,000,000.**

▲ **N. Y., Mount Vernon**—SCHOOL—Bd. Educ., 257 Fourth Ave., plans by Urbahn, Brayton & Burrows, 654 Madison Ave., New York, Zone 21, high school. **$4,500,000.** Bond election early in December.

▲ **N. Y., Oswego**—COLLEGE—Dpt. P. Wks., Albany, plans by Keally & Patterson, 17 E. 49th St., New York., Zone 19, classroom bldg. for State Teachers College of New York, **$4,000,000.** CD 3/26.

▲ **N. Y., Smithtown**—SCHOOL—Bd. Educ., plans by Ketchum, Gina & Sharp, 227 E. 44th St., New York, Zone 17, Junior-Senior High School. **$2,000,000.**

▲ **O., Columbus**—CLINICAL UNIT, etc.—Ohio State University, N. High St., plans by Bellman, Gillett, & Richards, 518 Jefferson, Toledo, clinical unit for Veterinary College, **$1,750,000;** plans by Ramsey Croce & Abbott, 490 City Park Ave., Animal Science Bldg and remodeling of Plumb Hall, **$1,428,000.** CD 4/18/56.

▲ **O., Columbus**—MEDIUM SECURITY INSTITUTION—Ohio Dpt. Mental Hygiene & Correction, 220 S. Parsons, Medium Security Institution consisting of 8 cottages and central facilities. **$1,750,000.**

▲ **O., Pemberville**—SCHOOL—Bd. Educ., Eastwood School Dist., Pemberville, bond election Nov. 5, High School, corner Sugar Ridge and Luckey Rds. **$1,248,000.**

▲† **Oregon**—DORMITORY BLDGS.—U. S. Engr., 4735 E. Marginal Way, Seattle 4, Wash., two 2 story, 40x85 ft. dormitory bldgs. and other structures for Sage facilities, Camp Adair, Corvallis. **$2,000,000.**

▲ **Tex., Austin**—PHYSICS—University of Texas, Main Admin. Bldg., plans by Fehr & Granger, 403-E 15th St.; Mark Lemmon, 201 Thomas Bldg., Dallas, physics bldg. **$1,050,000.** Wilson & Cottingham, Brown Bldg and Zumwait & Vinther, Merc. Sec. Bldg., Dallas, consult. engrs. Bids early in November. CD 8/5/57.

▲ **Tex., McAllen**—HOSPITAL—City, City Hall, plans by R. Newell Waters and Clark & Tomlinson, 468 Palermo St., Corpus Christi, and 1st National Bank Bldg., Weslaco, city hospital. **$1,000,000.** CD 9/11.

▲ **Tex., Midland**—SCHOOL—Midland Ind. School Dist. plans by Preston M. Geren, 1607 Fort Worth Nat'l Bank Bldg., Fort Worth, Junior-Senior High School. **$1,000,000.** CD 1/25/56.

▲ **Wash., Spokane**—SCHOOL—School Dist. 81, W 503 4 Ave., plans by Whitehouse, Price, DeNeff, Deeble & Evenoff, Hutton Bldg., 2 Junior High Schools in Coplen Park area. **$1,300,000.** CD 11/14.

COMMERCIAL BUILDINGS

▲ **Fla., Dania**—APARTMENT—Howard W. Ryan, 425 S. 28th Ave., plans by John Edwin May, 410 E. Beach Blvd., Hallandale, 1 and 2 story, 135 x 480 ft. CB-S U shaped air-conditioned co-operative apartment. Federal Hy. and SE 2nd St. **$1,000,000.**

▲ **Ill., Chicago**—LABORATORY, etc.—Northwestern University, 619 N. Clark St., plans by Holabird Root & Burgee, 180 N. Wabash Ave., 10 story, brick, Stanley Clark Laboratory, addn. to Ward Memorial Bldg., 303 E. Chicago Ave., **$1,000,000** 2 story, Robert R. McCormick Hall-Law School, Superior St. just W. of Lake Shore Dr. **$1,500,000.**

▲ **Ill., Highland Park**—SHOPPING CENTER—Greta Lederer, c/o Arthur Rubloff & Co., 100 W. Monroe St., Chicago, plans by Sidney H. Morris & Assocs., 134 N. LaSalle St., Chicago, or triangular area 435,000 sq. ft. Crossroads Shopping Center, bounded by Edens Expressway, Clavey Rd., and Skokie Valley Hys. **$1,500,000.**

▲ **La., Scotlandville**—DORMITORIES—Southern University of Louisiana, State Dpt. Educ., Capitol Bldg., Baton Rouge, plans by August Perez & Assocs., 314 Audubon Bldg., New Orleans, 3 dormitories for women, **$1,600,000.**

▲ **Md., Germantown**—HOUSING—Owner, c/o Charles M. Goodman, archt., 814 18th St., N. W., Wash., D. C., constr. 50 to 100 homes,in vicinity of here. **$1,000,000-$2,000,000.**

▲ **Mich., Kalamazoo**—DORMITORY, etc.—Nazareth College, Bd. Trustees, Kalamazoo, 3 dormitory buildings and other structures, incl. Activities Bldg., etc. **$6,000,000.**

▲ **Mich., Midland**—SHOPPING CENTER—Midland Plaza Center, c/o Charles A. Agree, Inc., archt., 1140 Book Bldg., Detroit, shopping center, US-10 and Eastland Rd. **$1,500,000.**

▲ **Minn., Northfield**—STUDENT CENTER—St. Olaf College, C. Johnson, administrator, Northfield, plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, and Sovik, Mathre & Assoc., Northfield, student center. **$1,250,000.** Bids probably next year.

▲ **Mo., Kansas City**—MOTOR HOTEL, etc.—Lewis E. Kitchen, R. A. Long Bldg., plans by Kivett & Myers & McCallum, 1016 Baltimore St., Cliff House Motor Hotel, swimming pool, 7th and Pennsylvania Sts. **$2,000,000.**

▲ **Mo., Nevada**—DORMITORY—Cottey College, c/o Dr. Orpha Stockard, dean, plans by Wm. B. Ittner, Inc., 911 Locust St., St. Louis, dormitory (girls) for 150, **$1,000,000.**

▲ **N. J., Atlantic City**—MOTEL—B C W Co., co Max Malamut, Shelbourne Hotel, Michigan Ave. and The Boardwalk, 140 unit motel with swimming pool, ice skating rink, etc. **$1,200,000.** Rodney C. Williams, 9 S. Granville Ave., Margate, archt.

▲ **N. Y., New York**—APARTMENT—Jackson A. Edwards & Sidney Kr[illegible] 545 Madison Ave., plans by H. I. Feldman, 41[illegible] Lexington Ave., Zone 17, apartment, 13-17 W. 12 St. **$1,000,000.**

▲ **N. Y., New York**—HOME FOR AGED—Home for Aged & Infirm Hebrews of New York, 121 W. 105 St., Zone 25, plans by Joseph D. Weiss, 2 W. 46 St., Zone 19, 7 story Gertrude-Frank Pavilion, 106 St. between Columbus and Amsterdam Aves. **$1,500,000.**

▲ **N. Y., New York**—HOUSING—Inwood Heights Apartments, c/o Kokkins & Lyras, 111 E. 38 St., plans by Brown & Guenther, 1860 Broadway, cooperative housing, Dyckman St., Hillside Ave., St. Nicholas Ave., near 200 St. **$3,000,000.**

▲ **N. Y., New York**—HOUSING—Inwood Terrace Apartments, c/o Kokkins & Lyras, 111 E. 38 St., plans by Brown & Guenther, 1860 Broadway, cooperative housing, Dyckman St., Hillside and St. Nicholas Aves., **$3,000,000.**

▲ **N. Y., New York**—DINING HALL—Manhattan College, Manhattan College Parkway and W. 242 St., plans by Eggers & Higgins, 100 E. 42 St., Zone 17, dining hall for 300 students. **$2,000,000.** CD 10/24.

▲ **N. Y., New York**—APARTMENT—Morris Rosen & Sons, Inc., c/o 192 E. 151 St., Zone 51, plans by H. Herbert & Clarence Lilien, 201 W. 72 [illegible], Zone 23, 8 story apartment, west side of Palisade Ave. corner Bradley Terrace. **$1,000,000.**

▲ **O., Barberton**—HOUSING, etc.—Owner, c/o Richard Hawley Cutting & Assocs., Inc., archt., 10550 Euclid Ave., Cleveland, Austin Development incl. 700 homes and apartments, shopping area, S. R. 619 between Robinson and Lockwood Corners Rds. **$2,000,000.**

▲ **Tenn., Memphis**—APARTMENT—Sam Bauman Jr., c/o Windrom, Haglund & Venable, archts., Hotel Chisca, 272 S. Main St., constr. T-shaped split level apartment. **$1,200,000.**

▲ **Tex., Corpus Christi**—BANK, etc.—Corpus Christi State National Bank, 502 Mesquite, plans by Rob. L. Vogler, 225 Oleander Ave., Carroll V. Tanner, 3340 Floyd St., Walter E. Wilde, 1733 S. Brownlee, all foregoing in Corpus Christi, and John A. Greeson, coord. archt., 5183 Huckleberry St., two 12 story bank, parking garage, **$1,750,000.** Bids in Spr[illegible] CD 10/8/56, under Corpus Christi Bank, as own[illegible]

▲ **Tex., Midland**—OFFICE—Owner, c/o T. J. Bettes Co., mortgagee; Continental Life Bldg., Fort Worth, plans by Chas. E. Armstrong, 1013½ University Dr., Fort Worth, 10 story, masonry, steel, concrete frame office, incl. 1 story parking garage, 2402 W. Wall St. **$1,000,000.**

INDUSTRIAL BUILDINGS

▲ **Md., Baltimore**—REFINERY—Kennecott Copper Corp., 161 East 42nd St., New York 17, N. Y., electrolytic copper refinery, near here. **$20,000,000.**

▲ **Miss., Gulfport**—GENERATING PLANT—Mississippi Power Co., Hancock Bank Bldg., second 100,000 hp generating plant, near here. **$10,000,000.**

▲ **Mo., St. Louis**—PLANT, etc.—Chrysler Corp., 344 Mass. Ave., Detroit, Mich., plans by Albert Kahn Associated Architects & Engineers, Inc., archt.-eng., 345 New Center Bldg., Detroit, Mich., 1 story, 1,300,000 sq. ft. assembly plant, 20 mi. southwest of downtown St. Louis, **$50,000,000.** CD 10/16.

▲ **N. J., Gillette**—LABORATORY—International Nickel Co., Inc., 67 Wall St., New York 5, N. Y., research laboratory on Mountain Ave. **$3,000,000.** Project to go ahead if voters OK zoning change on Nov. 5 election. CD 6/7.

▲ **Tex., Dallas**—PLANT, etc.—Gaylord Container Corp., Div. of Crown Zellerbach Corp., 7626 Denton Dr., plans by Robert & Co. Assocs., 96 Poplar N.W., Atlanta, Ga., corrugated box mfg. plant. **$1,250,000;** warehousing, **$300,000.** CD 10/22.

▲ **Tex., Galena Park**—PLANT—U. S. Gypsum Co., C. H. Shaver, Bd. Chm., 300 W. Adams St., Chicago, Ill., hdqtrs. and Galena Park, Tex., plant to mfg. gypsum wallboard, rock lathe, plaster, gypsum sheathing, **$25,000,000.**

▲ **Tex., Houston**—LABORATORY—The Texas Co., 720 San Jacinto, addnl. laboratory expansion, **$1,000,000.**

▲ **Wis., Kohler**—FACTORY—Kohler Co., Kohler, remodel factory, **$1,000,000.** Work to be done in parts.

▲ **Wis., Ripon**—FACTORY—Speed Queen Div. of McGraw Electric Co., plans by Sanstedt & Knoop, 22 Otter St., Oshkosh, 1 story, 50x203 ft. concrete, steel, brick, blocks 1st unit factory addn. **$1,000,000.** Bids soon.

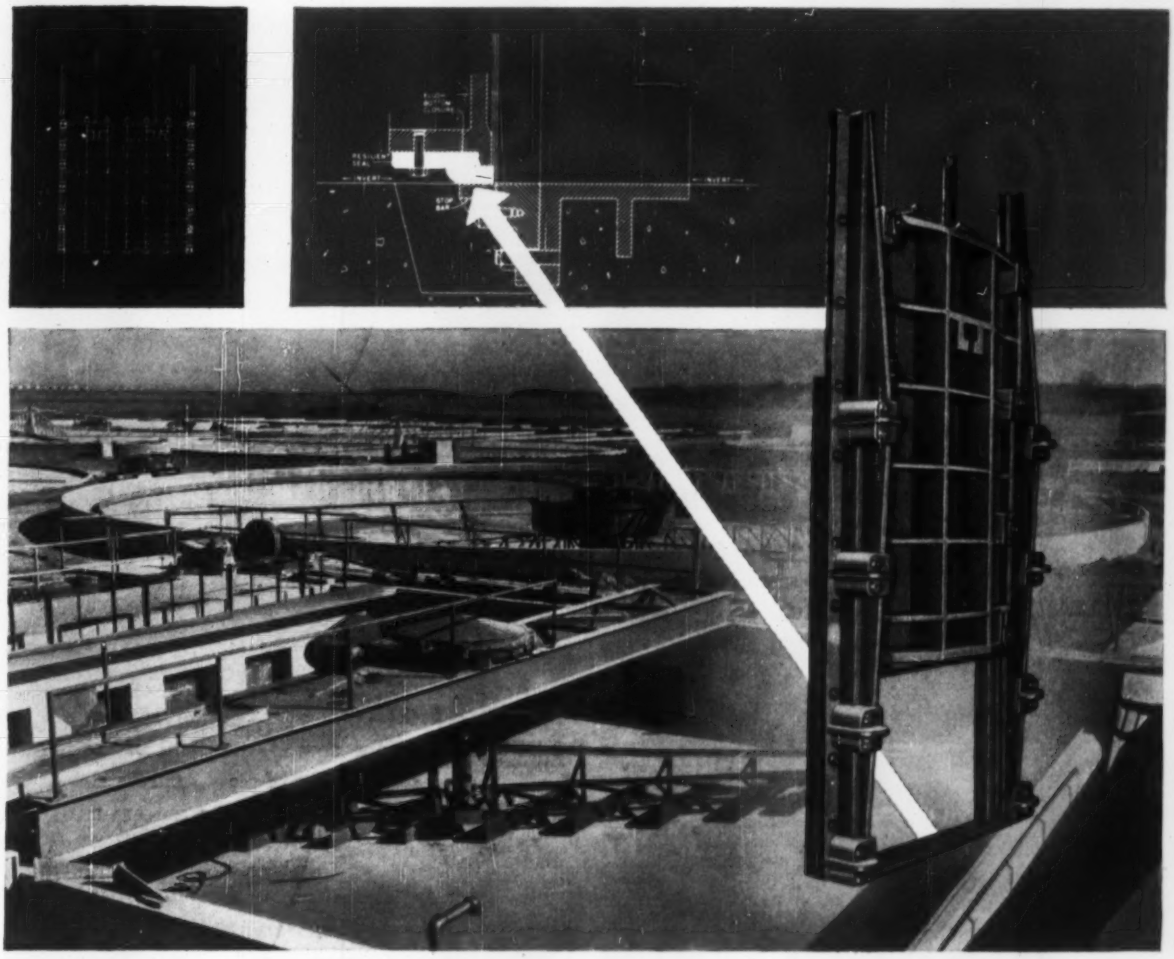
UNCLASSIFIED

▲ **Connecticut**—PARK—State P. Wks. Dpt., 165 Capitol Ave., Hartford, park, fill marsh land, increase parking area, new bathhouses, comfort stations, Madison, **$1,500,000.**

▲ **Conn., Westport**—PARK, etc.—State P. Wks. Dpt., 165 Capitol Ave., Hartford, Park, fill marsh land, new bathhouses, comfort stations, **$1,500,000.**

▲ **Kansas**—GAS LINES—Cities Service Gas Co., 1st Natl. Bldg., Oklahoma City, Okla., 41 mi. 30 in gas line from Verdigris River to Petrolia compressor station; 33 mi. 30 in. line between Petrolia and Welda compressor stations and 6 mi. 12 in. line in Reno Co. **$4,902,000.** FPC granted temporary authorization.

▲ **Mass., Braintree** — DISTRIBUTION ELECTRICITY — Town, Electric Light Dpt., 44 Allen St., distribution electricity for power plant, East Braintree, **$1,500,000.** Gilbert Assoc., Inc., 607 Washington St., Reading, Pa., engr. Bids about Nov. 15.



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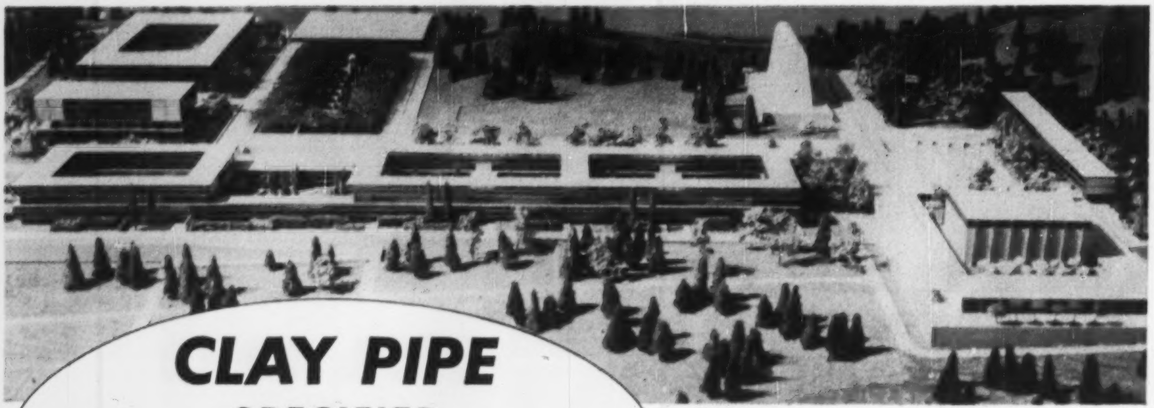

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C-157-1

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 18 Connecticut
STREETS AND ROADS
November 13 Maine November 15 Vermont

▲† **Massachusetts**—BA About 12/19—U. S. Eng., 111 E. 16th St., New York 3, N. Y., Unit 4, Part 1, constr. approx. 1,000 lin. ft. concrete wall, concrete chute, 12 drainage structures and excav. approx. 1,100 lin. ft. channel, North Adams. $1,000,000-$5,000,000. CD 9/9.

BUILDINGS—BA

▲ **Conn., Storrs**—FINE ARTS, etc.—BA 11/27—State P. Wks. Comr., 165 Capitol Ave., Hartford, Fine Arts Center, University of Conn., Proj. BI-D-2006. $3,623,817. Golden, Storrs & Co., 343 Fairfield Ave., Hartford, archts. Fred S. Dubin & Assocs., 178 S. Whitney St., Hartford, engrs. Plans deposit $40. CD 9/28.

BUILDINGS—SLC

▲ **Conn., Wallingford**—LABORATORY and PILOT PLANT—American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., soon lets contract laboratory and pilot plant, Cherry St. $1,500,000. Pedersen & Tilney, 111 Whitney Ave., New Haven, archts. Jaros, Baum & Bolles, 415 Lexington Ave., New York, N. Y., engrs. CD 3/21/56.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 10/29, M. **Dematteo Constr. Co.**, 411 Mt. Vernon St., Dorchester, Mass., LB **$1,635,329**, est. $2,019,486, Franite St. Interchange, incl. bridges and culverts, Rte. 128 relocation, U-229(14), Braintree. CD 10/18.

BUILDINGS—LB & CA

▲ **Granger Constr. Co., Inc.**, 306 Main St., Worcester, Mass., LB **$1,414,000.** U-803R LIBRARY Addn., University of Mass., AMHERST, MASS. Commonwealth Mass., Dpt. Educ., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Oct. 25. CD 10/2/57.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† **New York**—BA About 1/2—U. S. Eng., 111 E. 16 St. New York, Zone 3, approx. 8,800 lin. ft. levees, 2 pumping plants, 4 drainage structures, 1 closure structure and excavation approx. 2,500 lin. ft. channel, Susquehanna River, Endicott Johnson City and Vestal (West Endicott Unit No. 4). $1,000,000-$5,000,000. CD 4/21/44.

BUILDINGS—BA

▲ **Md., College Park**—DORMITORIES—BA 11/21—University of Maryland, College Park, constr. Worcester Hall, women's dormitory, T. Englehardt, 933 Gist Ave., Silver Spring, archt. CD 2/25; Cecil Hall, men's dormitory, Walton & Maddon, 3510 Rhode Island Ave., Mt. Rainier, archts. CD 2/24; Frederick Hall addn., Walton & Maddon, 3510 Rhode Island Ave., Mt. Rainier, archts.; Dorchester Hall, women's dormitory, Johannes & Murray, 855 Pershing Dr., Silver Spring, archts. CD 8/31/56. Total est. $1,500,000. Plans deposit $25 per bldg.

▲ **N. Y., Freeport**—SCHOOL—BA 12/19—Bd. Educ., Union Free School Dist. No. 9, Freeport High School, Freeport, Freeport High School, Brookside Ave. $4,000,000. Extended date. Frederick P. Wiedersum Assoc., 85 W. Hawthorne Ave., Valley Stream, archts. CD 10/25.

HEAVY CONSTRUCTION—LB & CA

▲ **Spearin, Preston & Burrows, Inc.**, 50 Church St., New York, N. Y., CA **$2,971,053**, est. $2,595,408, plant outfall, Coney Island Pollution Control Proj., 3rd stage, Contr. No. 1, BROOKLYN, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids July 17. CD 8/8.

BUILDINGS—LB & CA

▲ **Leon D. DeMatteis Constr. Co.**, 827 Elmont Rd., Elmont, N. Y., CA **$2,435,827** general construction LIBRARY, CLASSROOM and ADMINISTRATION BLDG. Hunter College, Bronx Unit, south side of Goulden Ave., 695 ft. south of Bedford Park Blvd., Bronx Boro, NEW YORK, N. Y. Bd. Higher Educ., Hunter College, Business Office, 695 Park Ave., New York 21, N. Y. Bids Oct. 8. CD 10/10, under LB.

▲ **Jones Siding Corp. (Leo Greenburg)**, 165 Lafayette Ave., Passaic, N. J. Own Forces. **$3,200,000,** 200 HOUSES in Wynnewood at Route 9, FREEHOLD, N. J. Stephen J. Potter, 410 Colonial Ave., Union, N. J., archt.

▲ **Felix Clauss & Sons**, Northeast Ave. and Red Lion Rd., Phila., Pa., Separate Contracts. **$1,380,000.** RESIDENTIAL DEVELOPMENT, Irvin Rd., etc., ABINGTON, PA. H. Stanley Atkinson, 18th and Market Sts., Phila. Pa., archt.

▲ **Browdie-Manchester & Co.**, 3 Pooks Hill Rd., Bethesda, Md. Owner Builds. **$3,500,000.** 505 UNIT APARTMENT-HOTEL, Pooks Hill, BETHESDA, MD. J. Fitzsimmons, 1731 New Hampshire Ave. N.W., Washington, D. C.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 22 Kentucky
STREETS AND ROADS
November 22 Kentucky

BUILDINGS—BA

▲ **Ga., Atlanta**—CLASSROOM—BA 12/17—University System Bldg. Auth., 244 Washington St., S. W., classroom bldg. for Ga. Institute of Technology, $2,404,320. Plans deposit $50. A. Thomas Bradbury & Assocs., 60-5th St. N.E., archt. CD 3/4/57.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., 1221 E. Broad St., Richmond,

Va.—**Nello L. Terr Co., Inc.**, Box 1131, Durham, N. C. CA **$2,777,693,** 2 lanes 24 ft. x 7½ in. b. conc. pavt. and 4 bridges 4.89 mi. Rte. 402 0.84 mi. n. of NCL Buchanan ending at 0.27 mi. south of Interstate Rte. 610. State Proj. 8011-01-02-03-04-05-06, Fed. Proj. I-200-2 (2) R/W (1) Botecourt Co. CA **$974,501,** 2.13 mi. Rte. 402 407 beginning at 3.73 mi. E. Tenn. line ending 4.97 mi. E. Tenn. line and NCL Bristol, 0.89 mi. N. of NCL Bristol State Proj. 8095-01; 8395-01 Fed. Proj. I-202 1 (1) I-207-1 (1) Washington Co.;

Va.—**Barnhill & Long,** Tarboro, N. C. CA **$937,934** grade, drain 7.22 mi. Rte. 401 beginning at N. C. State Line 3.79 mi. S. of Interstate Rte. 58 State Proj. 8040-12-19, Fed. Proj. I-201-1 (2) R/W (8). Greensville Co.;

Va.—**W. E. Graham & Sons,** Box 268, Cleveland, N. C. CA **$853,892,** 24 ft. x 5½ in. b. conc. 1.06 mi. Rte. 220 58, and 502 ft. bridge beginning at 1.34 mi. S. of SCL Matinsville, State Proj. 1844-30-31-32, Fed. Proj. F-03-3 (4) Hendry Co. Grand total $6,544,020. Bids Oct. 16. CD 10/21, under LB.

BUILDINGS—LB & CA

▲ **A. C. Samford, Inc.,** Box 1229, Albany, Ga., LB **$4,278,800,** INDUSTRIAL SCHOOL for BOYS, (FLA-PROJ. 341) OKEECHOBEE, FLA. Bd. Comrs., State Institutions, Terry C. Lee, secy., Tallahassee, Fla. Robert Maysin, 1719 N. Monroe St., archt. and Charles F. Kuhn, assocs. archt., 1719 Monroe St., both Tallahassee, Fla. Bids Oct. 23. CD 9/25.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 19 Wisconsin
STREETS AND ROADS
November 13 Michigan November 19 Wisconsin

BUILDINGS—LB & CA

▲ **Virginia Eng. Co., Inc.,** 80 29 St., Newport News, Va., CA **$3,808,464,** WAREHOUSE, OFFICE BLDG., BAKERY BLDG. and DAIRY BLDG., INDIANAPOLIS, IND. The Kroger Co., 1011 E. St. Clair St., Indianapolis, Ind., Bids Oct. 9. CD 9/20.

▲ **Mayfair Constr. Co.,** 5660 N. Kedzie Ave., Chicago, Ill., CA **$3,036,510,** 2 story, brick, stone Wm. J. Bogan HIGH SCHOOL with swimming pool and paving, 79 St. and Pulaski Rd., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Oct. 14. CD 10/22, under CA.

▲ **A. Z. Shmina & Sons, Inc.,** 122 W. 4th Ave., Ann Arbor, Mich., CA **$2,387,000,** Group III, PRO No. 96, Northwood APARTMENTS, ANN ARBOR, MICH. Bd. Regents, University of Mich., Plant Service Bldg., N. University and Forest Aves., Ann Arbor. Bids Oct. 8. CD 10/25, under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 15 North Dakota November 21 Texas
STREETS AND ROADS
November 12, 13 Texas November 15 North Dakota

BUILDINGS—BA

▲ **Okla., Oklahoma City**—OFFICE—BA 12/10—South Western Bell Co., 405 N. Broadway, plans by Sorey, Hill & Sorey, 809 N.W. 36th St., 9 story office bldg., 6th and Robinson Sts. $3,000,000. CD 8/30/56.

▲ **Tex., Galena Park**—PLANT—Bids Asked—U. S. Gypsum Co., c/o E. J. Emery, purch. agt., 300 W. Adams St., Chicago, Ill. and Galena Park, Tex., mfg. plant in 30-acre tract on Houston Ship channel $25,000,000. CD 10/25.

BUILDINGS—LB & CA

▲ **Dondlinger & Sons,** 1206 E. Lincoln, Wichita, Kan., CA **$1,376,914,** general contract 10 story Y.M.C.A. BLDG. at 3rd and Market Sts., WICHITA, KAN. Y.M.C.A., 424 East 1st St., Wichita, Kan. Bids Oct. 11. CD 10/2.

Ripstra-Turner Co., 1015 E. Douglas, Wichita, Kan., CA **$355,521,** mechanical work for Y.M.C.A. (Wichita, Kan.).

▲† **V. O. Stringfellow,** 5407 20th St. N.W., Seattle, Wash., LB **$6,499,700,** est. $6,000,000., 450 family HOUSING UNITS at Clinton Air Base, CLINTON, OKLA., Eighth Naval Dist., at Bldg. S-420, Foss, Okla. Hudgins, Thompson & Ball, 1411 Classen St., Oklahoma City, Okla., archts. Bids Oct. 15. CD 9/12.

▲ **W. R. Grimshaw Co.,** Enterprise Bldg., Tulsa, Okla., CA Est. **$3,000,000,** 9 story, bsmnt. OFFICE BLDG., 6th and Denver Sts., TULSA, OKLA. Amerada Petroleum Corp., 6th and Denver Sts., Tulsa, Okla. W. W. Aschlager, 2515 Turtle Blvd., Dallas, Tex., archts. Awarded Oct. 17. CD 6/13.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 27 California

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 10/24,

Ukropina, Polich & Kral, P. O. Box 105, San Gabriel, Calif., LB **$4,878,927** (12 bidders) 1.6 mi. Golden State Freeway in Glendate and Burbank between 0.3 mi. south of Alameda Ave. and Burbank Blvd., incl. 6 major structures, VII-La 4, GNDL, BRB, Los Angeles Co. CD 9/18.

BUILDINGS—LB & CA

▲ **The Pacific Co.,** 801 Cedar St., Berkeley, Calif. CA **$2,237,400** wood frame except shop and gym, rein.-con. Clayton Valley HIGH SCHOOL, Clayton, CONCORD, CALIF. Mount Diablo Unified School Dist., c/o Supt., Concord, Calif. Bids Oct. 8. CD 10/16, under LB.

▲† **Williams & Burrows, Inc.,** 500 Harbor, Belmont, Calif., CA **$3,197,470** STEAM PLANT, utilities, parking area, for Sandia Corp., LIVERMORE, CALIF. U. S. Atomic Energy Comn., 518 17 St., Oakland, Calif., CD 10/4, under LB.

▲ **Robert E. McKee,** 4701 San Fernando Rd., West, Los Angeles 39, Calif., CA **$2,773,300** general work two 2 story, 225,000 sq. ft. floor area and 8 roofed shelter areas, WARD BLDGS. at Patton State Hospital W. O. 3774, G. C. 4007GC-50 PATTON, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids Oct. 2, awarded Oct. 24. CD 10/8, under LB.;

E. O. Nay Co., Inc., 2014 East Colorado St., Pasadena, Calif. CA **$816,349** mechanical work ward bldgs. (Patton, Calif.).

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 13, 27 Ontario

▲ **Ont., Port Arthur**—BA 12/12—Ontario Water Resources Comn., East Block, Parliament Bldgs., Toronto, **(A)** 13,000 lin. ft. 48- to 60-in. sanitary trunk sewers and 4,300 lin. ft. 18- to 36-in. storm relief sewers, **(B)** sewage treatment plant: $2,000,000. Plans deposit $100 each. R. V. Anderson & Assocs. Ltd., 194 Wilson Ave., Toronto, engrs. CD 5/2.

HEAVY CONSTRUCTION—LB & CA

▲ **McNamara Constr. Ltd.,** 348 Dominion Square Bldg., Montreal, Que. LB **$2,172,821** (6 bidders) 4th section, Decarie-Raimbault Collector Sewer, between Decarie Blvd. and Stinson St., MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Oct. 23. CD 10/7.

BUILDINGS—LB & CA

▲ **Ernest Cote Ltee,** 730 rue des Oblats, Quebec City, Que., CA Approx. **$1,500,000,** 7 story, 127x149 ft. HOSPITAL addn. at Hospital St. Sacrament, 440 Chemin Ste., Foye, QUEBEC CITY, QUE. Hospital du St. Sacrament, 440 Chemin Ste. Foye, Quebec City, Que. Pierre Warren, 138 Grand Allee, Quebec City, Que., engr. Pierre Rinfret, 1134 Chemin St. Louis, Sillery, Que., archt.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

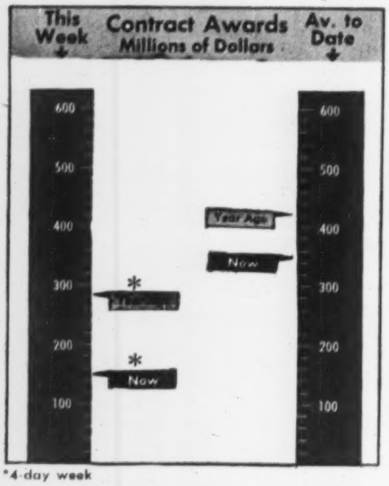
▲† **NICARAGUA**—Bureau P. Rds., Dpt. Commerce, Inter-American Hy. Office, Wash., D. C., U.S.A.

Nello L. Teer Co., P.O. Box 1131, Durham, N. C., U.S.A., CA **$1,594,081,** Rama Road Proj. R-3B, grading, drainage, special sub-base, other work beginning at Espabel River and extending approx. 15 mi. east to Cedro Macho River, Rama Road Proj. R-3B. CD 10/17, under LB.

(Proposal Advertisement see pp. 153 to 156)

Construction Scoreboard

Activity this Week



*4-day week

AMOUNT OF CONTRACTS LET

By Ownership	This Week*	Cum. 45 wks 1957	Chge '56-'57
	millions		%
Federal	$12.0	$2,037.8	+37
State and Municipal	58.6	6,408.9	+12
Total Public	70.6	8,446.7	+17
Total Private	77.3	7,488.2	−37
U. S. Total	$147.9*	$15,934.9	−16

By Type of Work			
Waterworks	$1.4	$312.2	−1
Sewerage	7.5	480.1	−9
Bridges	5.2	620.5	+14
Highways	22.0	2,612.5	+20
Earthwork, Waterways	3.6	898.2	+37
Buildings:			
Public, Excl. Housg.	19.4	2,003.7	+11
Public Housing	8.9	599.9	+109
Private Housing	36.1	2,675.1	−45
Commercial	21.1	1,521.7	−9
Industrial	18.1	2,810.1	−39
Unclassified	4.6	1,400.9	−10
U. S. Total	$147.9*	$15,934.9	−16

* 4-day week

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

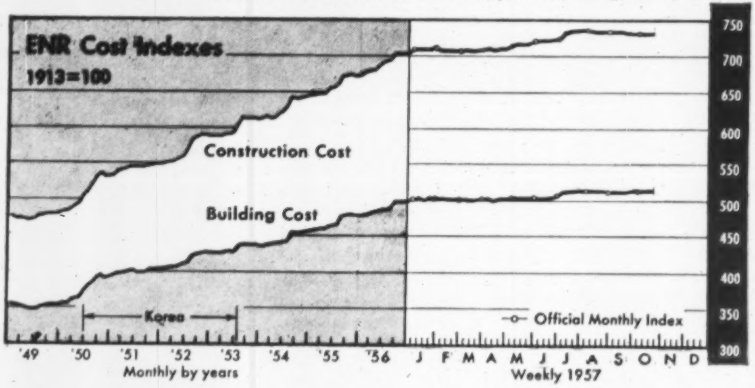
	Week of Oct. 31	Cum. 44 wks 1957	Chge '56-'57
	millions		%
Corporate Securities	$278.3	$5,161.8	+24
State and Municipal:			
All Except Housing	144.2	4,774.9	+19
Housing	...	155.8	+268
Federal Loans	3.4	179.6	+34
Federal Aid	...	2,161.2	+102
Total Nonfederal	$425.9	$12,433.3	+32
Federal Appropriations:			
In U. S.	...	$2,777.0	−20
Outside U. S.	...	29.0	+82
Total New Capital	$425.9	$15,239.3	+18

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of Oct. 31 1957	% Change from Oct. 3 1957	% Change from Nov. 1 1956
Construction Cost	737.43*	+0.04%	+4.73%
Building Cost	516.81*	+0.06	+3.26

* Official Monthly Index for November

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518



WAGE RATES, 20-cities' average	Nov. 1957	% Change from Oct. 1957	% Change from Nov. 1956
Common	2.336	+0.07%	+6.57%
Skilled (average 3 trades)	3.606	+0.06	+5.04
Bricklayers	3.863	+0.10	+4.15
Structural Ironworkers	3.624	0	6.24
Carpenters	3.331	0	4.98
Equipment Operators (average three types)	3.237*	+0.4**	+7.6*

* October **September

MATERIAL PRICES, 20-cities' average			
Structural Steel (average 3 mills), per cwt	5.275	0	+5.5
Lumber, 2x4 Fir, per M fbm	114.597	−0.24	−2.18
Lumber, 2x4 Pine, per M fbm	100.366	−0.07	−2.68
Cement, bulk, per bbl	3.923	0	+4.34
Sand, per ton	2.487	0	+2.85
Ready-mixed concrete, per cu yd	13.696	−0.18	+2.13
Gypsum sheathing, ½"x2'x8', per Msf*	63.110	0	+2.80
Fiber board sheathing, ½" sq. ed., per Msf*	71.300	0	+2.21
Mineral wool insulation, 3' batts, per Msf*	71.063	+0.13	+0.13
Crushed stone, 1½", per ton, CL	2.810	0	+6.09
Concrete blocks, sand gravel, 8"x8"x16", each*	.229	0	+1.78

	Oct. 1957	Sept. 1957	Oct. 1956
Brick, common, per M	37.688	+0.03	+1.69
Lime, hydrated finishing, per ton, CL	38.098	+4.38	+11.89
Structural Clay tile, 3x12x12", per M, 2,000 up*	180.533	0	+3.76
Vitrified clay sewer pipe, std 12", per ft	1.312	+0.08	+6.06
Concrete sewer pipe, 12", per ft	1.231	+1.57	+7.18

* Delivered, trucklots

ENR INDEX REVIEW

	Construction Cost		Building Cost		Volume	
1956	1913 = 100	1949 = 100	1913 = 100	1949 = 100	1913 = 100	1949 = 100
Nov	704.13	147.61	500.48	142.27	542	157
Dec	703.82	147.55	500.17	142.18	624	180
1956 Average	692.37	145.14	490.76	139.50	671	194
1957						
Jan	707.90	148.40	501.96	142.69	504	146
Feb	710.06	148.85	502.59	142.87	546	158
Mar	708.64	148.56	501.37	142.52	553	160
Apr	709.30	148.69	501.37	142.52	564	163
May	715.70	150.04	503.01	142.99	553	160
June	721.36	151.22	504.17	143.32	588	170
July	724.15	151.81	506.62	144.01	587	170
Aug	738.63	154.84	516.90	146.93	528	153
Sept	737.78	154.66	516.12	146.71	466	135
Oct	737.14	154.53	516.78	146.90	506	146
Nov	737.43	154.59	516.81	146.91		...

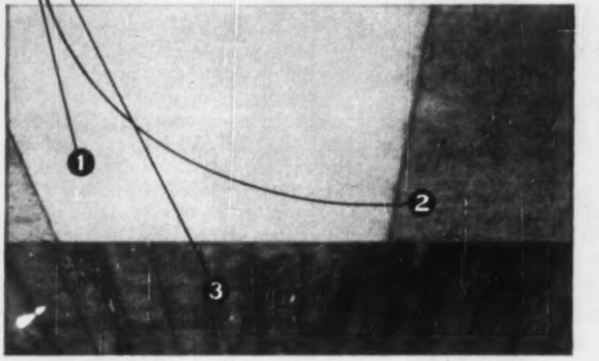
3 reasons why PLYGLAZE® high-density* overlaid plywood outperforms any form material on the market

1. FORMS SMOOTHER CONCRETE

Hard, glossy-smooth fused resin-fiber surfaces form flawlessly smooth concrete, with no trace of grain pattern. Unretouched photo shows marked difference in appearance quality of concrete cast against PlyGlaze, ordinary plywood and shiplap.

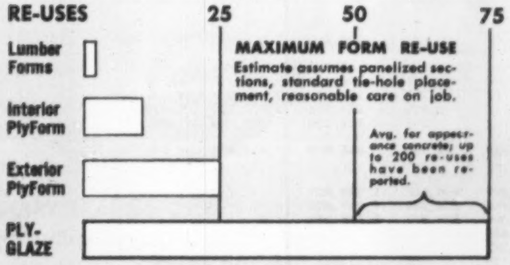
RELATIVE APPEARANCE OF CONCRETE

	Up to 50% of Max. Re-Use	Up to 100% of Max. Re-Use	Where to Use
1. PLYGLAZE	Excellent	Good	For smoothest concrete, maximum re-uses
2. PLYFORM	Good to Fair	Fair to Poor	For fairly smooth concrete, multiple re-uses
3. LUMBER	Poor	Very Poor	Where appearance and re-use not important



2. GIVES MANY MORE RE-USES

PlyGlaze's tough, hard surface stands up under hundreds of pours. With reasonable care, you'll easily get 50 to 75 re-uses. Actually over 200 have been obtained—and even then PlyGlaze continued to form good looking concrete.



Estimate assumes panelized sections, standard tie-hole placement, reasonable care on job.

Avg. for appearance concrete; up to 200 re-uses have been reported.

3. HELPS CUT COSTS TWO WAYS

A. TIME & LABOR SAVINGS—Sharply reduces rubbing and finishing labor. Ceiling slabs can be painted direct, eliminating expensive plastering. PlyGlaze also cuts form construction, erection and stripping time. High re-use factor eliminates form reconstruction during job.

B. LOW COST PER USE—Even when cost is sole criterion, greater number of PlyGlaze re-uses frequently more than make up for higher initial cost, particularly where costs can be amortized over 25 or more pours.

COST PER-SQUARE-FOOT-PER-USE

No. Re-Uses ➤	1	10	25	50	100	200
PLYGLAZE	$0.375	.038	.015	.008	.004	.002
Exterior PLYFORM	.234	.023	.009	Gives Max. 25 Re-Uses		
Interior PLYFORM	.218	.022	Gives Maximum 10-12 Re-Uses			
LUMBER	.110	Gives Maximum 2-3 Re-Uses				

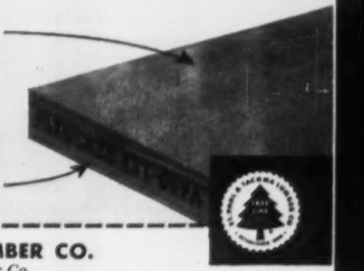
Estimates based on 30 month average for prices quoted by St. Paul & Tacoma for following material delivered in Chicago: ¾" PlyGlaze; ¾" Ext. & Int. PlyForm, mill oiled, edge sealed; 2 & btr. 1" green Douglas fir or hemlock.

POINTS IN BRIEF

- Has the strength, workability and adaptability of ordinary plywood.
- Strips easily; the non-absorbent surfaces will not stick to the concrete.
- No oiling is needed between the pours other than to facilitate cleaning.
- Overlay will not soften or come loose. Unharmed by alkaline reaction.
- Overlay minimizes moisture pickup and the resultant loss of rigidity.

Hard, glossy, translucent high density* fused-resin fiber overlay bonded to both sides of panel. Resin content controlled to give exact amount of hardness and wear resistance required for form work.

Base panel is top quality DFPA-Inspected solid core Exterior fir plywood. Available in all standard sizes, thicknesses.



ST. PAUL & TACOMA LUMBER CO.
Subsidiary of St. Regis Paper Co.
DEPT. RN, TACOMA 1, WASHINGTON

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Name ____________________
Firm ____________________
Address ____________________
City ____________ Zone ____ State ____________

*HIGH DENSITY (glossy, translucent overlay) is special concrete form panel. MEDIUM DENSITY overlay (opaque with texture similar to drawing paper) is paint grade; not for form work.

October Contract Awards Gain Strength

Total volume tops September by 9% with most major types of work rising; dips noted in highways, housing

Heavy construction contract awards in October, as reported by ENGINEERING NEWS-RECORD and CONSTRUCTION DAILY, rose 9% above September, based on average weekly volume. However, the total of $1.7 billion for last month was down 28% from the amount tallied in October 1956.

The month brought increases in most major types of heavy construction, with the biggest gains over September registered in waterworks, bridges, public buildings and unclassified—both public and private (see table below).

Commercial building and private industrial building both registered slight increases, but private mass housing dipped slightly under the weekly average rate of September.

Three major types of public works failed to increase last month: highways, sewerage and earthwork-irrigation-dams. However, highway contracts dipped only slightly and came close to matching awards in this category during September. But sewerage awards dropped 21% from September and earthwork-irrigation-dams slumped 61% from the September tally.

Compared to October 1956, all types of work were lower, except public nonresidential building and public housing. And in many cases, the drop from the October 1956 pace was substantial.

Highways, surprisingly enough, were 15% below the year ago pace. And all major types of private construction were down from 32% (commercial building) to 44% (industrial building).

On the monthly basis, the biggest increases during October came in waterworks, up 153%; public unclassified, up 72% and public buildings other than housing, public housing and bridge awards, up 35% to 40%. In the overall picture, federal awards gained 36% over September and state and municipal contracts increased 7%.

In private construction, which as a whole rose 8% in October, unclassified racked up a 161% gain over September. Industrial and commercial contracts posted slight gains of 1% to 4%, but mass housing dipped 4% under the weekly average established in September.

The year-to-year decline of 28% for October is much greater than the overall decline for the 10 months as a whole.

For private work, the 39% deficit from last year is approximately the same as the 10 months drop of 37%. But there is evidence that the drop in private work is bottoming out. Since hitting the June low, the trend in private contracts has been a generally sidewise movement, with October awards being higher than each of the preceding four months.

ENR Cost Indexes Show Only Small Upward Move

Construction costs rose only slightly in October as measured by ENR's Construction Cost and Building Cost indexes. The Construction Cost Index rose from 737.14 to 737.43, a change of .04%. The Building Cost Index rose .06% from 516.78 to 516.81. Both indexes are based on 1913 = 100.

The stability results from offsetting changes in lumber prices and wage rates, with lumber falling in six cities and rising in only three. And only two cities—New Orleans and San Francisco—reported increases in construction labor rates.

The Construction Cost Index is up 4.73% from November 1956 and the Building Cost Index is up by 3.26% from the same period. Most of the rise results from increased labor costs, because the materials cost component of the two indexes rose only 1.69% from November 1956 to November 1957.

Common labor wage rates increased faster than skilled rates.

(*B&F continued on page 145*)

Engineering Construction Contracts—October '57

ENGINEERING NEWS-RECORD reports continental U. S. construction projects of the following minimum costs—waterworks, excavation, drainage and irrigation, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

Five Weeks Thousands of Dollars (000 Omitted)

	October, 1957							U. S. Cumulative Ten Months		%	
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1957 (44 weeks)	1956 (43 weeks)	Change '56 to '57 Av. Wk.	Canada October 1957
Public Works											
Waterworks	366	3,754	3,197	3,714	12,264	25,531	**48,826**	**310,947**	304,124	...	2,248
Sewerage	1,772	4,017	4,602	19,546	7,095	10,666	**47,698**	**472,531**	506,378	− 9	3,719
Bridges	9,129	1,496	11,596	17,859	17,075	4,795	**61,950**	**606,809**	508,455	+17	2,733
Earthwork and waterways	393	14,976	5,302	597	8,512	11,971	**41,751**	**894,733**	640,233	+37	1,983
Streets and roads	11,011	39,986	56,410	40,034	70,164	20,048	**237,653**	**2,590,552**	2,053,820	+23	19,842
Public buildings, residential		28,482	27,557	2,240	8,925	4,964	**72,168**	**590,626**	285,722	+102	4,964
Other public buildings	17,575	57,439	53,487	58,228	43,195	35,835	**265,759**	**1,984,172**	1,721,003	+13	20,826
Unclassified	1,463	19,723	10,392	2,222	15,012	8,625	**57,437**	**925,786**	890,601	+ 2	11,684
Total Public	**41,709**	**169,873**	**172,543**	**144,440**	**182,242**	**122,435**	**833,242**	**8,376,156**	**6,910,336**	+18	**67,999**
Federal government (included in above classifications)	1,786	10,260	56,497	3,669	32,067	25,607	**129,886**	**2,025,857**	1,449,999	+37	6,076
Private											
Bridges				5,585			**5,585**	**8,676**	4,404	+93	...
Industrial buildings	12,851	49,472	81,141	37,379	58,600	27,067	**266,510**	**2,792,159**	4,525,161	−40	6,275
Mass housing	34,657	157,100	13,913	51,902	56,366	17,767	**331,705**	**2,638,985**	4,699,129	−45	15,677
Commercial buildings	12,188	72,916	3,610	27,310	35,742	9,828	**161,594**	**1,500,733**	1,603,781	− 9	5,554
Unclassified	2,640	1,938	...	26,882	68,847	929	**101,236**	**470,336**	643,215	−29	1,376
Total Private	**62,336**	**281,426**	**98,664**	**149,058**	**219,555**	**55,591**	**866,630**	**7,410,889**	**11,475,690**	**−37**	**28,882**
Total Engineering Construction:											
October, 1957 5 weeks	**104,045**	**451,299**	**271,207**	**293,498**	**401,797**	**178,026**	**1,699,872**	...	...	...	**96,881**
September, 1957—4 weeks	94,771	315,758	210,021	245,200	218,144	163,202	**1,247,096**	...	...	...	**104,799**
October, 1956—4 weeks	78,097	480,167	285,522	384,987	320,095	328,873	**1,878,341**	...	...	...	124,150
Ten Months 1957	**1,045,874**	**3,795,936**	**1,981,427**	**3,515,941**	**2,985,934**	**2,461,933**	...	**15,787,045**	...	**−16**	**1,321,459**
Ten Months—1956	968,203	4,670,935	2,199,622	3,932,187	3,896,233	2,718,846	...	...	18,386,026	...	1,889,801
% Change '56 to '57 Av. Wk.	+6	−21	−12	−13	−25	−12	...	...	...	...	−32

Only DIETZ Visi-flash gives LONGER "On and Off" Timing for STRONGER Warning

ACCIDENT RECORDS indicate that rapidly flashing warning lights are seen, *but not heeded.* That's due to the fact that the human eye retains an impression of a flash from 1/50 to 1/30 of a second after it has vanished. If the flashes are rapid enough, the eye may imagine it sees a succession of diminishing flickers that are not there. The result is confusion, not action.

Only a long, steady flash registers a meaningful warning on the human mind. *Only a longer "off" time* enables the human eye to recover from one flash and see the next one clearly. The Dietz Visi-flash is timed to give the most ideal "on" and "off" timing of any flashing signal on the market.

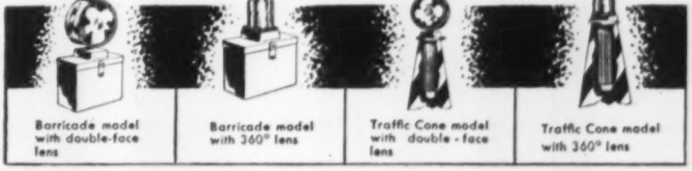
◀ **For Proof, See the Oscillograph Photos at Left**

DIETZ ENGINEERS have skillfully balanced the "on" and "off" timing of the Visi-flash with the design, color and area of the lens to produce a warning light that says "STOP — DANGER" in a way that combines visibility with meaning and authority.

Visi-flash is

- Highly visible
- Easy on Batteries
- Shock resistant
- Weather proof
- Easier to maintain
- Longer lasting
- Lower in cost

AVAILABLE IN TYPES FOR EVERY NEED


Barricade model with double-face lens

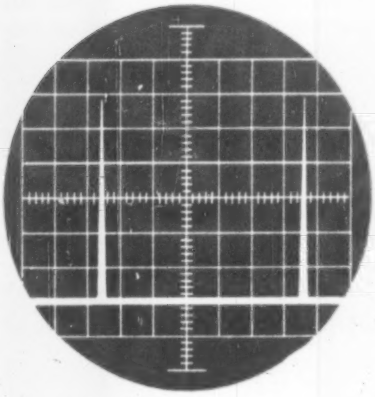
Barricade model with 360° lens

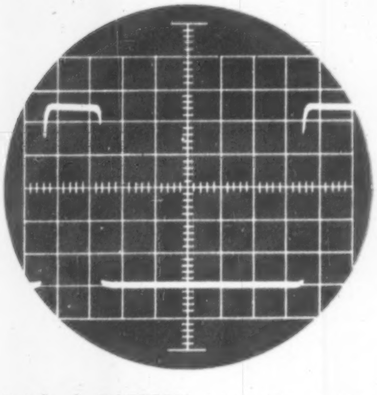
Traffic Cone model with double-face lens

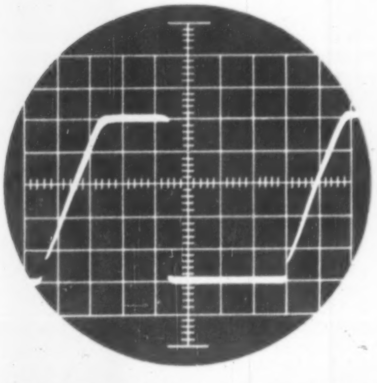
Traffic Cone model with 360° lens

Go **DIETZ** *and you go Safely*

R. E. DIETZ CO. **SYRACUSE 1, N. Y.**


NEON TUBE PATTERN The Oscillograph automatically times the "on" and "off" pulses of the light. It shows here that the neon tube flasher has an extremely short "on" time . . . too brief and fast to register strongly on the human mind.


Visi-flash PATTERN. Notice that the Dietz Visi-flash has a much longer "on" time than its competitors, and that its "off" time is 8 times longer than its "on" time . . . a pause long enough to rest the eye and to make the next flash meaningful.


ORDINARY TRANSISTORIZED CIRCUIT PATTERN. Here, the "on" and "off" timing is not at ideal setting . . . and the light varies in strength due to the current used in heating the bulb.

Stones and rocks made digging tough.

Compact rugged Cleveland's smooth crawler mounting real public relations asset in 70,000′ tough digging

The light weight, hi-tensile alloy steel construction and smooth crawler mounting of this Cleveland 92 "Baby Digger" enabled Rich & Co., Bradford, Pa. to cut 70,000 feet of trench in stony tough digging without causing damage to the sidewalks and fine old lawns in and around Groton, N. Y. The compact design and quick-and-easy maneuverability of the 92 were other big helps in digging these 4-inch pipe gas mains and laterals for New York State Electric and Gas Co., Ithaca, N. Y. The rugged 92 weighs only 10,000 pounds, is only 4½ feet wide over its crawlers, yet digs 10 to 20 inch trench widths and down to full 5 feet deep—in *all* soils.

The 10,000 lb. 92 treads lightly on lawn and sidewalks.

Compact 92 can put trench within 20″ of side obstructions.

Good *Everywhere* ®

THE CLEVELAND TRENCHER COMPANY

20100 St. Clair Avenue • Cleveland 17, Ohio

Personnel:

From Campus to Construction "Super"

The top executives of Perini Corp., Framingham, Mass., are convinced that it is possible to send out a boy to do a man's job. Their conviction is tangibly supported by the first two graduates of the company's training program designed to produce supervisory personnel. One, at 27, now is the firm's superintendent in charge of plant and concrete at Hydro-Quebec's development, Bersimis II, Labrieville, Que. The other, 29, serves the company as superintendent of construction on a drydock at Bethlehem Shipyards, Quincy, Mass. Both completed the course last May.

It is no accident or turn of fate, however, that sees these two youths—Gerald J. Candela, a civil engineering graduate of Rensselaer Polytechnic Institute, and Irving R. Huie, from Notre Dame—possessing work attitudes, supervisory ability and decisive initiative that would most usually be expected of men much older in years and in experience. Instead, their qualities are the result of a well-planned and forward-looking program that was conceived and placed into operation by Louis R. Perini, president of the corporation.

The idea for the course was first dropped on the board room table five years ago by Mr. Perini, who almost casually observed before a management meeting that the growth and success of the company would depend to a great extent on the ability to develop young men to supplement and enlarge the existing supervisory staff.

"TEACHER" **Louis R. Perini, founder of the program that trains college boys to become construction "stiffs," in the firm he heads—Perini Corp.**

On a more personal note, and one calculated to drive home his point, Mr. Perini perhaps jarred the executives present by reminding them that "we are not getting any younger and yet we have but very few young men being trained for the future." The group decided on some general policies and then set out to investigate possible training programs in effect within the construction industry. Training programs for engineering in the automotive, electrical and steel industries also were studied.

During this period the company learned that although construction companies had many methods for selecting their recently graduated engineers, they had no formal training programs for them after they were hired. But the other three industries had several ideas which were adapted to the program.

At the outset, Mr. Perini wanted a training course that would develop good construction "stiffs"—men who would shape into top supervisory personnel. And with this as the jump-off point, six engineering schools in the U. S. and two in Canada were selected to be the source of raw material.

The choice of candidates is not based upon high scholastic achievement. The graduate engineers in the corporation concluded that any man who survives the curriculum of a well-known engineering school and receives his engineering degree already has proven his intellectual capacities. Going one step further, the company is most interested in the student who perhaps sacrificed top grades in order to take part in outside activities.

If a candidate has taken part in competitive sports—so much the better. The company discovered that the athlete or the individual who has taken part in extra-curricular activities, is invariably

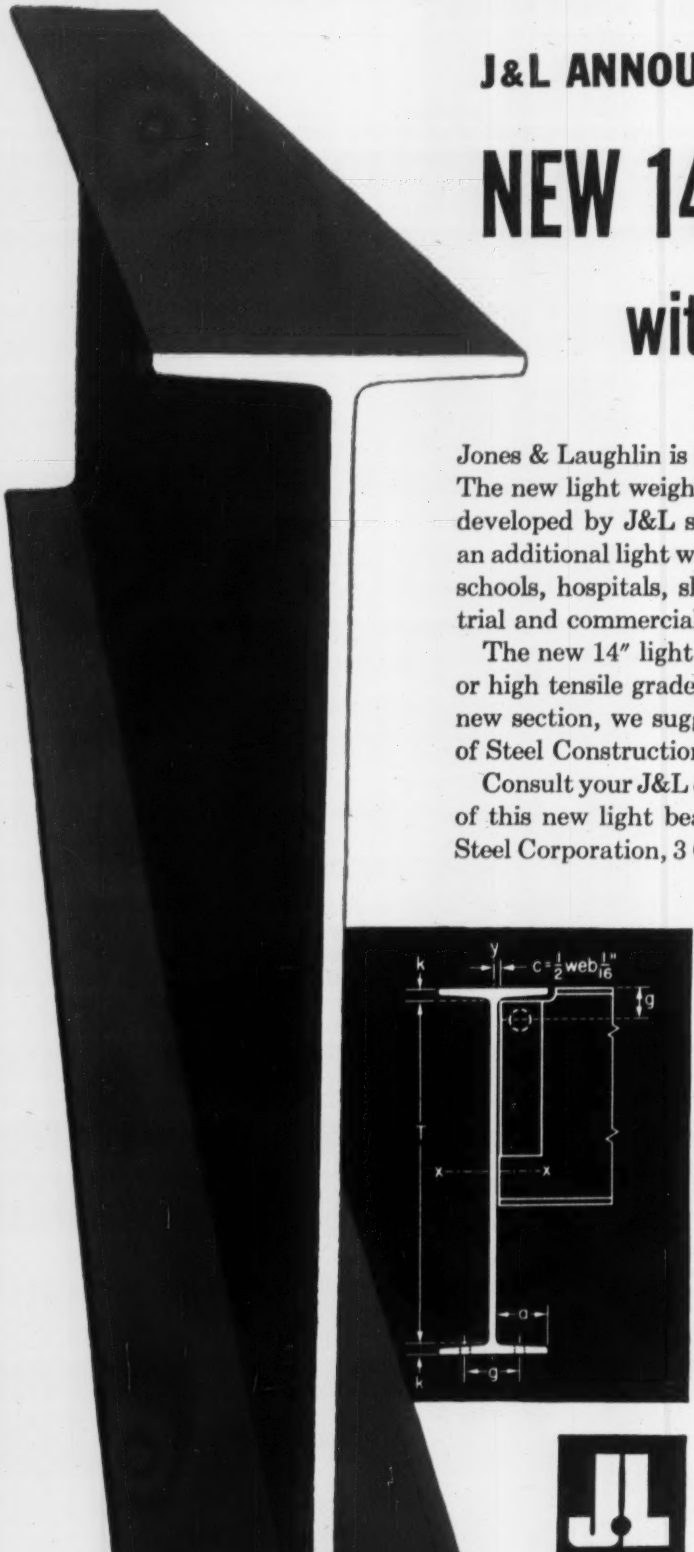
IRVING R. HUIE, **graduated from the Perini "college" for construction "stiffs." He's now superintendent in charge of construction on a drydock at Bethlehem Shipyards.**

GERALD J. CANDELA, **left foreground, was graduated with Irving Huie in May and now is superintendent in charge of plant and concrete, Hydro-Quebec's development, Bersimis II.**

J&L ANNOUNCES

NEW 14″ LIGHT BEAM

with 4″ flange



Jones & Laughlin is now producing a 14″, 17.2 lb. light beam. The new light weight hot rolled section, with a 4″ flange, was developed by J&L structural engineers to meet the need for an additional light weight section in the design of apartments, schools, hospitals, shopping centers, parking garages, industrial and commercial buildings.

The new 14″ light beam can be furnished in regular carbon or high tensile grades. For properties and design data on this new section, we suggest you refer to the American Institute of Steel Construction Manual.

Consult your J&L district sales office concerning availability of this new light beam, or write direct to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pa.

Properties for Designing	
Nominal size	14 x 4 in.
Weight per foot	17.2 lb.
Area	5.05 in.^{2}
Depth	14.0 in.
Flange—Width	4.0 in.
Mean thickness	.272 in.
Web thickness	.210 in.
Axis X-X—I	147.3 in.^{4}
S	21.0 in.^{3}
r	5.40 in.
Axis Y-Y—I	2.65 in.^{4}
S	1.32 in.^{3}
r	.72 in.

Properties for Detailing	
Nominal size	14 x 4 in.
Weight per foot	17.2 lb.
Depth	14 in.
Flange—Width	4 in.
Mean thickness	¼ in.
Web—Thickness	3/16 in.
Half thickness	⅛ in.
Distance—a	1⅞ in.
T	12⅞ in.
k	9/16 in.
g_1	1¾ in.
c	3/16 in.
Max. flange rivet	¾ in.
Usual gage—g	2¼ in.

Jones & Laughlin

STEEL . . . a great name in steel

a good mixer, a team worker, an organizer, ingenious and a leader. H. A. Letoile, assistant to the president, on the point of competitive sports added, "Unfortunately, not many engineers find time for athletics in college."

• The program—The training course is established on a four year basis, but this is flexible, depending upon the trainees. It may be longer or it may be shorter. Irving Huie and Gerald Candela completed their training in 43 and 44 months respectively.

The program in general:

- Quantity takeoff and introduction to office procedures—3 months.
- Mechanical and electrical—3 months.
- Carpenter foreman—6 months.
- Concrete foreman—3 months.
- Excavation and grading foreman—3 months.
- Rock, drilling and grouting—3 months.
- Drainage and structures—3 months.
- Cost engineering, purchasing, administration—4 months.
- Estimating—5 months.
- Assistant superintendent or assistant engineer—12 months.

During the first three months of training, a student works in one of the company's offices. For field engineering and layout work, the trainee is sent to one of the field offices.

A trainee gets a major dose of cost problems in the mechanical and electrical phase. The corporation does not expect to make mechanical experts out of them in the three month period, but it is expected he will acquire the knowledge that any good superintendent should have by working with a master mechanic. In this course, the trainee analyzes the equipment repair costs, the time involved in making repairs and the production loss resulting from out-of-service equipment.

The trainee then gets his first taste of supervision when he is sent out as a carpenter foreman. He is given a crew, for which he is responsible. He does form work, and keeps track of costs, materials and labor. This phase of training may be split into two separate jobs such as a powerhouse or a highway bridge.

As a concrete foreman, a student is given a crew of men and takes charge of concrete placement. If the trainee has worked on a highway or a dam during his first foreman job, the company will attempt to put him into tunnel work during his service as a concrete foreman.

After completing the various foreman courses, the trainee returns to a company office for cost engineering, purchasing, administration and estimating. This last is a separate course, and between experience in the field and the office procedures preceding the estimating, the student is in a position to take off quantities and start pricing the items for which the company is submitting bids.

• Time for appraisal—After completing the estimating course, the trainee has finished three years of the program. The company, aware that not all trainees can make the grade in three years, now appraises the trainee as to capability before allowing him to assume supervisory responsibility. So far, the company has found that those who worked on construction during the vacations of their college years are most likely to succeed at the end of the three years.

During the final year of the course, the trainee is assigned as an assistant superintendent or assistant engineer. For six months he is sent out to one project and given the responsibility of several work crews, reporting either to the project manager or the general superintendent. The last six months, still as an assistant superintendent or assistant engineer, the trainee works at a different project under another project manager.

When the final year of training is completed, a successful trainee is graduated to the position of superintendent in charge of a construction job.

• Cost of program—Perini corporation officials have not attempted to figure the cost of the program because they feel it is negligible. The trainees are paid a minimum of $450 a month for the first year and in each succeeding year are given a $50 monthly increase. However, when a man is in the mechanical or foreman stage of training, he receives the going rate for those categories, plus overtime pay for any overtime work accrued. In any case, the trainee never is paid less than the established minimum.

The company feels that although the trainees may not be as experienced as some of the older supervisors, the additional hours they work equitably compensates for any lack of efficiency that may come from inexperience.

It is obvious that the long-run advantages far outweigh the possible initial disadvantage of inexperience. First, the students are trained as the company wants them to be. Also, the trainee quickly becomes aware of the opportunities for advancement open to him, even to an executive level in the firm.

• Program flexibility—The company does not maintain a rigid program either in principle or practice. Although the course was established to develop supervisors, the company acknowledges the fact that a man will do his best work in a job he most likes. If, for example, a trainee shows strong leanings toward engineering and continues to show that desire after graduation from the training program, he will be retained with the firm in an engineering capacity.

The company intends to maintain this program flexibility and is even willing to step outside its own program to this end.

For example, of the 18 students now in training, one, who is about one year along in the program, has expressed a desire for the financial and business operations of construction. So, the company is giving serious consideration to sending him to the Graduate School of Business Administration, Harvard University, either midway in his training or upon completion. This move would serve at a test case to explore the possibilities of a combination course of engineering, job training and formal business training.

• Reason for the program—The training course was established to make up for what the company feels is a deficiency in the engineering curriculum of the schools (see also p. 23). Officials of the Perini corporation believe that the universities and colleges are placing more and more stress on theory. In addition, they believe that many engineering graduates are being prepared for the atomic, supersonic, and electronic fields, with only very few of them aiming directly at the construction business.

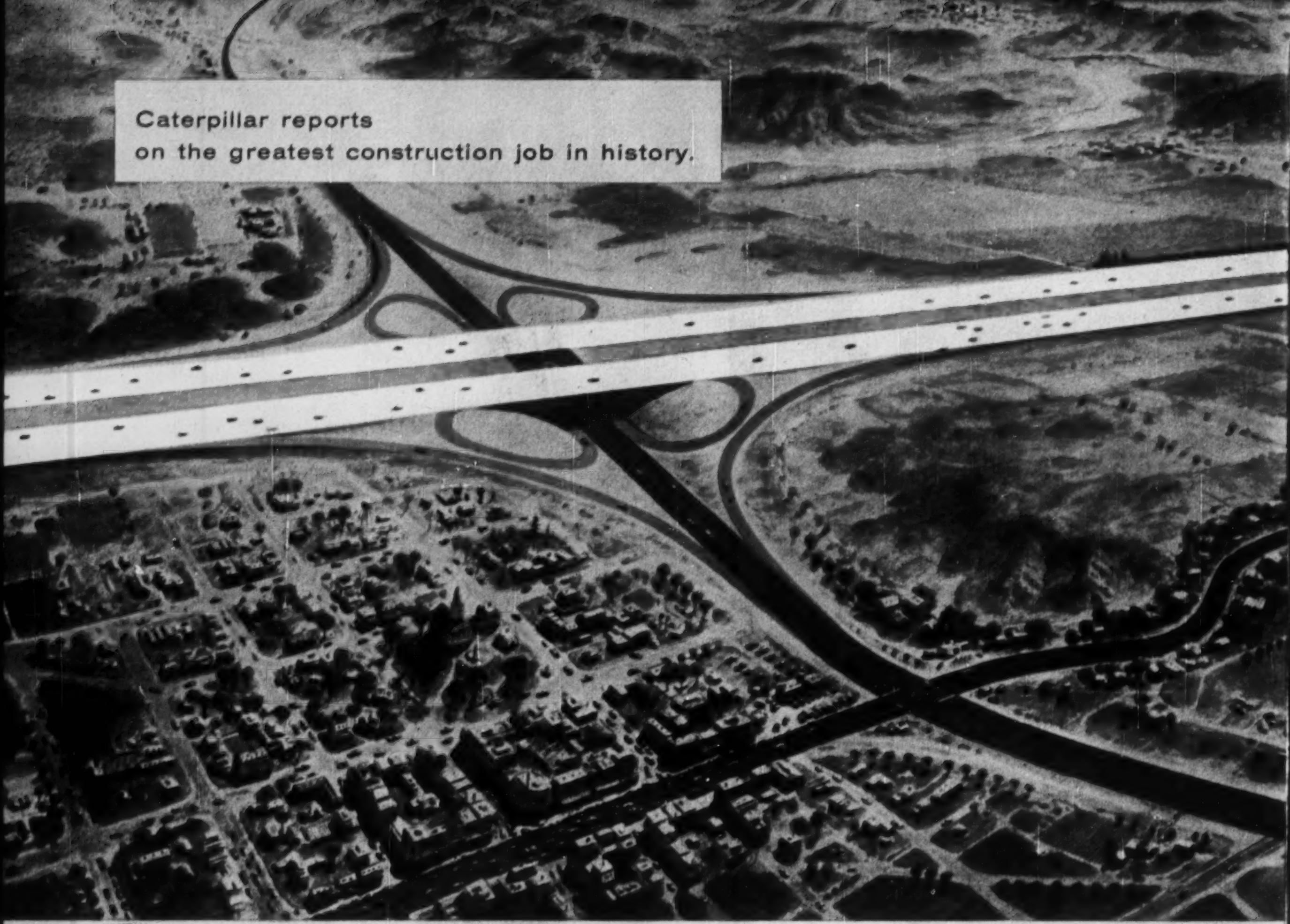
San Francisco Bridge Co. Dissolved After 73 Years

A 73 year old San Francisco dredging company—the San Francisco Bridge Co. —has gone out of business. Seven of its fleet of eight suction dredges have been sold to other dredging firms, the eighth is being dismantled for scrap.

No official explanation for dissolution of the company was given, although it is understood that Barrett Hindes, president and majority stockholder, planned to retire. All reports indicate that the firm has been operating at a profit. It recently completed a large dredging contract at the Alameda Naval Air Station.

Many of the company's personnel will become affiliated with Pacific Dredging Co., one of three firms that bought four of the dissolved firm's dredges.

The company traces its origin back to John McMullen who established a carpenter business in San Francisco in 1876.



Caterpillar reports
on the greatest construction job in history.

Here's what a typical portion of the magnificent Interstate Highway System is going to look like.

[Colors refer to section of road in picture above.]

▨ ***INTERSTATE SYSTEM FREEWAY***

Depending on traffic demands, a Freeway will be 2, 4, 6 or 8 lanes—each lane at least 12 feet in width. Shoulders will be at least 10 feet; center strips, in rural areas, will be a minimum of 36 feet wide. States will set speed limits, but, to provide a margin of safety, the Freeways are designed for 50 MPH in urban areas to 70 MPH in open, flat country. These super roads will go around most towns to speed your trip and to give townspeople relief from dangerous congestion caused by through traffic. The Freeways will be of "Controlled Access" design. That means there will be no intersections. No railroad crossings. Not even driveways. This safety design is expected to save thousands of lives a year! When the Freeways cross a road like this—

■ ***STATE HIGHWAY***

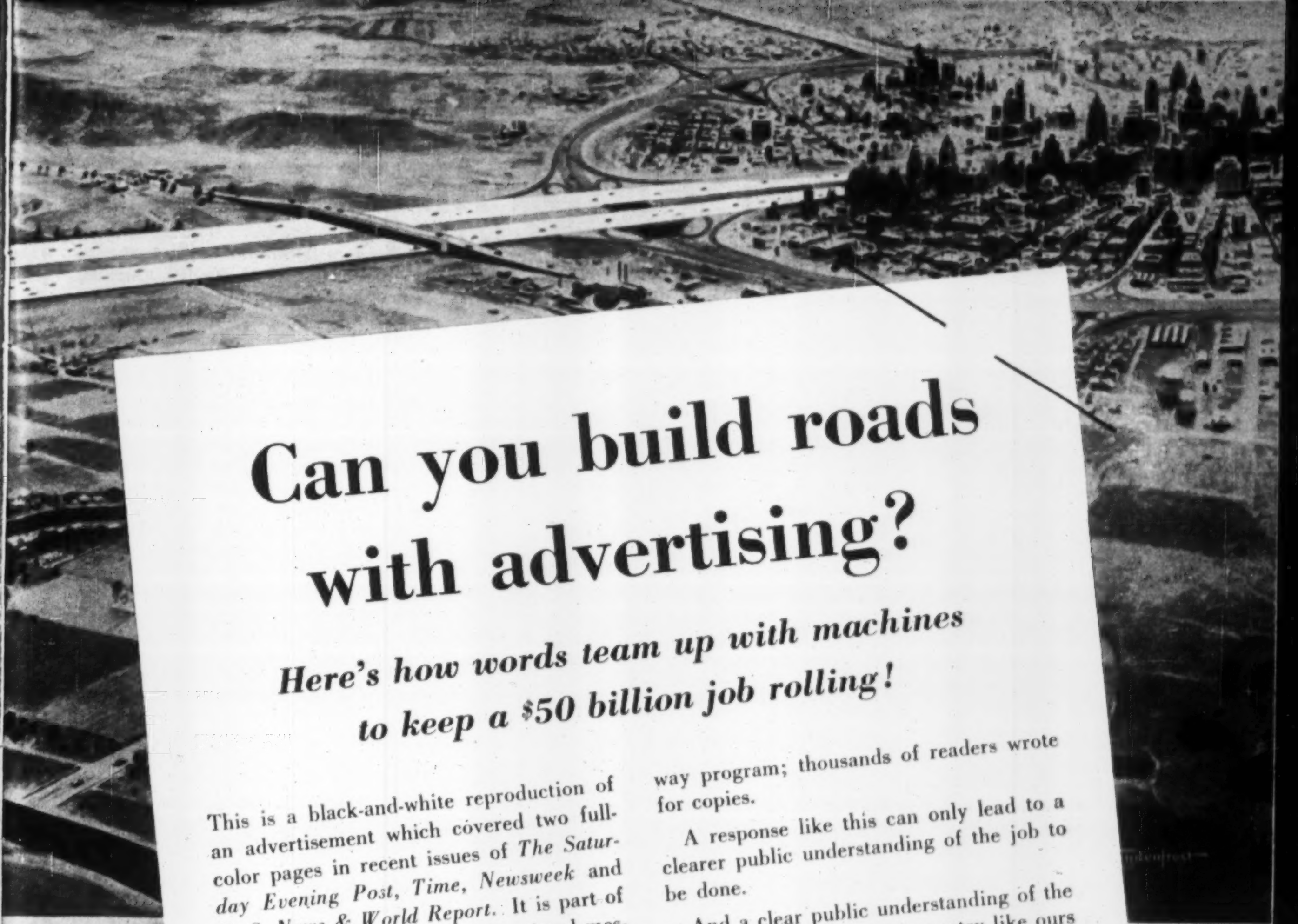
—either an underpass or overpass will be built, eliminating a dangerous intersection. State highways like this, and farm-to-market roads (dark gray

This is no dream! We're building 41,000 miles of Freeways like this

Work has started! Money's authorized!

It's the Interstate Highway System—part of the nation's gigantic

$50 billion road building program. Here's what it means to you.



Can you build roads with advertising?

Here's how words team up with machines to keep a $50 billion job rolling!

This is a black-and-white reproduction of an advertisement which covered two full-color pages in recent issues of *The Saturday Evening Post, Time, Newsweek* and *U. S. News & World Report.* It is part of Caterpillar's campaign of educational messages presented to keep public opinion informed and alert regarding this country's $50 billion road building program.

Men and machines will build our highways, but one roadblock still in their path is public misunderstanding. It will take an *interested* and *enlightened* citizenry to keep the biggest construction job in history on the track.

Advertising helps! Take the sample you see here. It reviewed carefully the scope of the Federal-aid program; educators asked permission to reprint. It illustrated a color-keyed guide to a typical portion of the Interstate Highway System; state officials are using it now in their own educational programs. It offered a booklet, "The Road Ahead," explaining in detail the highway program; thousands of readers wrote for copies.

A response like this can only lead to a clearer public understanding of the job to be done.

And a clear public understanding of the job can only mean—in a country like ours—that the job will continue to push ahead.

Whenever you see this signature in an advertisement . . .

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE WORLD'S NO. 1
ROAD BUILDING EQUIPMENT

. . . remember that not only are fleets of Caterpillar machines on the job building the new Freeways, but Caterpillar advertising is helping to mold the public opinion that will keep the $50 billion job rolling.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

above), will also be
will get on and off th

ACCESS

They will p
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and to leave the same
where traffic requires
should be *at least* one
time to merge smoothly.

Hop in the
without a traffi
life. You'll be
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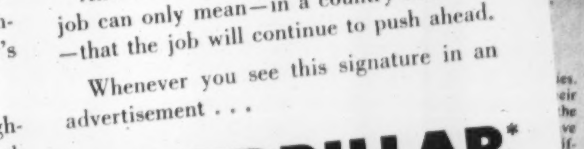


Critical Labor Problems Ahead

Teamsters reject AFL-CIO clean-up ultimatum and industrial unions stand firm on work jurisdiction

An imminent union showdown seemed inevitable last week on two explosive labor problems that cut deep into the construction industry.

- The International Brotherhood of Teamsters invited expulsion from the united labor movement by again defying the AFL-CIO.
- The federation's Industrial Union Department (IUD) served notice that its affiliates will not relinquish their historical and certified jurisdictional claims to what the building trades unions call "construction work" in industrial plants, and recommended adoption of machinery terminating in arbitration as a constructive solution to the inter-union conflict.

Both problems are expected to play a dominant role at the upcoming union conventions at Atlantic City, N. J., in December.

Speaking at the second constitutional convention of the IUD on Friday, however, AFL-CIO President George Meany said he was "not pessimistic" about the results of either problem. Reaffirming his faith in the aims and purposes of a united labor movement, he said he was "confident" that the federation's intolerance of union corruption will contribute to a stronger and more effective—though perhaps smarter—AFL-CIO and that an acceptable solution will be found to the perplexing jurisdictional conflict between the building trades and industrial unions:

- **Teamsters**—Teamster refusal to accept an AFL-CIO ultimatum to clean up or get out came in the form of a decision to appeal suspension of the union to the AFL-CIO convention floor. The action was taken by the teamsters' executive board on Oct. 31—just a week after the federation suspended the union and voted to recommend expulsion unless it:

1. Discarded James Hoffa and other officers charged with malpractices.
2. Agreed to a house cleaning under AFL-CIO supervision. President Meany is expected to finalize the suspension immediately, requiring all affiliates at the departmental, state and local levels to sever their ties with the teamsters.

As outlined by Dave Beck, the teamsters' position is that the AFL-CIO has violated the union's legal and constitutional rights in these respects: It has invaded the union's autonomous rights; it has adopted as fact the *ex parte* and unproven charges of the McClellan committee; and its actions are based on situations that occurred, for the most part, before the AFL-CIO legally came into being.

Mr. Beck, who expects to remain at the union's helm until a successor is able to take over, said the teamsters will continue to work "as usual" with other international unions, putting the burden on AFL-CIO affiliates to invoke the suspension order. Two of the areas he specifically mentioned were departmental activities (and this includes the Building Trades Department) and the union's mutual assistance four-way pact with the carpenters, operating engineers and laborers unions. (Maurice Hutcheson, carpenters' president who voted against the suspension, once promised that his union would support its pacts with the teamsters in or out of the AFL-CIO).

- **Jurisdiction**—Concurrently, the AFL-CIO's vigorous and dynamic Industrial Union Department made clear its position that labor unity can never be achieved unless and until the building trades unions agree:

1. To submit jurisdictional disputes to final and binding arbitration.
2. To refrain from picketing and boycott activity in attempts to obtain in-plant work performed by industrial union members. A resolution was adopted calling for acceptance of arbitration as a constructive solution to the problem.

The building trades claim that industrial unions are gobbling up their jurisdiction by performing various types of in-plant construction work traditionally within the jurisdiction of the building trades. They have refused to accept a formula embracing arbitration, and the AFL-CIO has found no mutually acceptable solution to the problem in two years of effort since the merger.

In a hard-hitting address at the opening session of the IUD convention, IUD President Walter Reuther said that "until the American labor movement is willing to agree to a rational procedure with some sort of a terminal provision with arbitration" as a solution to the jurisdictional conflict, "we are going to continue to have strife and misunderstanding."

The IUD is the largest department of the AFL-CIO and is the second largest labor entity (not including the AFL-CIO) in the free world. It has 71 affiliates representing 7.2 million union workers.

Mr. Reuther told the IUD delegates that the arbitration proposal, based on a "live and let live" philosophy, relates only to the arbitration of specific disputes "based on the facts as the facts are reflected by past practice. . . . No one, at no time and at no meeting has ever proposed an agreement that would provide for the arbitration of the basic jurisdiction of any union."

Referring to boycotts, he said that no union in the united labor movement "has either an organizational right, an economic right or a moral right to refuse to install equipment and material produced by the members of some other union" in the federation. (Such a situation occurred recently when members of the sheet metal workers union refused to handle ventilating equipment made by Ohio's Burt Manufacturing Co., which is organized by the steelworkers union.) Mr. Reuther urged that the AFL-CIO adopt stern measures against such boycotts by unequivocal changes in its constitution.

No Room for Unions?

NEPE official sees end to unions for engineers

A union movement among America's professional engineers has run its course and is failing because unionism "is by its very nature coercive, achieving its ends by threats and force, thereby stifling initiative."

That opinion was advanced by Milton F. Lunch, of Washington, D. C., executive assistant, National Society of Professional Engineers, in an address last week before the Erie County Chapter of NSPE in Buffalo, N. Y.

"A union can't do what professional engineers can and should do," Mr. Lunch declared, "and that is to develop greater knowledge and skills."

Mr. Lunch said that the union movement, which began after World War II due to rapid industrial growth, has "run its course," adding that many who call themselves engineers in unions "are merely technicians and machinists."

(Leader in the field of unionization has been Engineers and Scientists of America, which was formed in 1953 as a national federation of engineering employees in collective bargaining units in private industry and in government. With a membership of 40,000, including 3,000 bona fide civil engineers, ESA has tended to pattern itself after the technical societies, and this year voted to limit its membership to professional engineers. Result is the formation, by a splinter group, of Engineers and Scientists Guild, which will embrace both engineering professional and technical employees and which expects to come into being shortly with a membership in excess of 20,000. Its founders feel that failure to organize is "tantamount to group suicide." Primary purpose of ESG will be to improve the economic status and occupational dignity of its members through collective bargaining and to advance the technical and professional development of science and engineering.)

Roving Pickets Violate Boycott Ban, Court Says

In a split decision, a U. S. Circuit Court of Appeals last week ruled that members of the teamsters union, on strike against a concrete supplier, violated the secondary boycott provisions of the Taft-Hartley Act by picketing the company's trucks when they made deliveries at construction sites.

The case arose in Atlanta, where the union was on strike against Campbell Coal Co. Teamsters followed the trucks to construction sites and engaged in picketing during deliveries.

Secondary boycott charges were filed against the union local and were upheld by the National Labor Relations Board. The board said that when construction workers ceased working as a direct result of the picketing, the union had accomplished its objective of attempting to force neutral employers (the contractors) to stop doing business with the primary employer (Campbell Coal). Such activity is banned by the Taft-Hartley Act.

Although the majority of the Court of Appeals in Washington, D. C., upheld the NLRB, Judge David Bazelon dissented. His reasoning was that the construction workers who were not engaged in the dispute were free to support the teamsters "out of feelings of solidarity" and that the law does not forbid such gratuitous support.

Does your lead go ROUND AND ROUND?

or is it held in the bull dog grip of A.W.Faber

CASTELL LOCKTITE

two styles—Telegrade and Regular

Three things make LOCKTITE Holder tower over all other holders on the market:

1. Gun-rifled clutch grips the lead like the jaws of a bull dog. Lead *will not turn* when pointed in any type sharpener, blade or mechanical sander.
2. Push-button control advances the lead without touching fingers, thus avoiding graphite stain.
3. LOCKTITE is *feather light,* looks like a pencil, feels like a pencil. No tricked-up shape to get used to.

Imported Castell Leads

For supreme satisfaction use LOCKTITE with imported CASTELL 9030 lead in 19 degrees, the same quality lead that made CASTELL wood pencil famous in every civilized country in the world. Call your Dealer today.

A.W.FABER - CASTELL
PENCIL COMPANY INC. NEWARK 3, N. J.

A.W.FABER CASTELL LOCKTITE 9800
A.W.FABER CASTELL LOCKTITE 9400 2H
A.W.FABER CASTELL

CUTTING WIRE ROPE IS EASY

the MORSE-STARRETT way

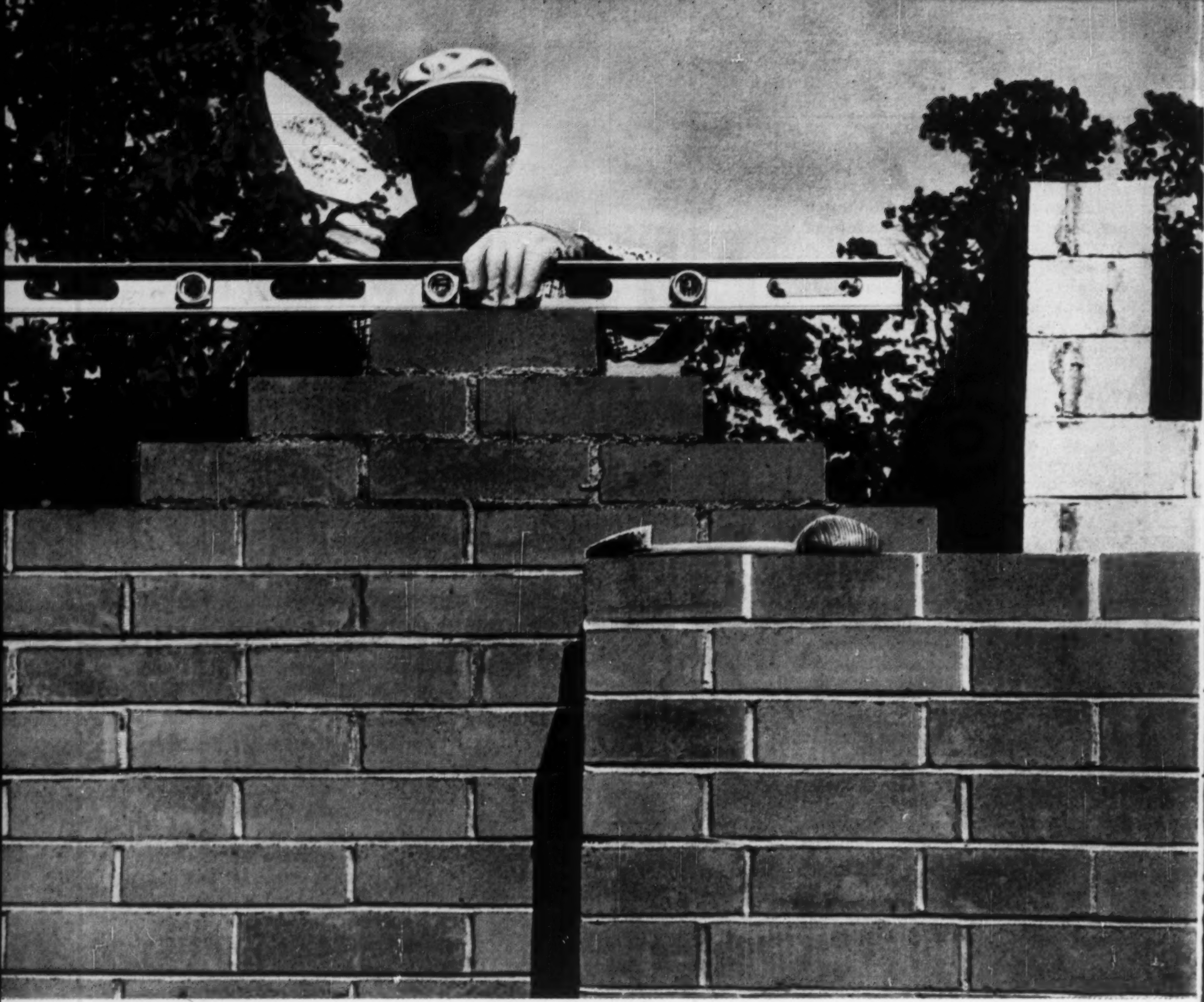
FAST Especially designed cutting blade and dies assures fast cutting action. The hammer principle eliminates any special skill requirements.

CLEAN Wire rope ends are cut smooth and clean for perfect threading or splicing.

SAFE The enclosed cutting blade locked in the body of the cutter assures perfect safety.

PORTABLE Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1-1/16 inch, 1-1/2 inch.

SEE YOUR DEALER OR WRITE DEPT. "B"
MORSE-STARRETT PRODUCTS CO.
1204 - 49th AVENUE, OAKLAND 1, CALIFORNIA



TRUE, TIGHT JOINTS were obtained with Atlas Mortar cement in laying colored masonry units (8″ x 12″ x 3½″) at McKinley Shopping Center, South Bend, Ind., according to masonry contractor Hugh M. Lee of Niles, Mich. General contractor, Paul Woodcox; Architect, Charles T. Donegan; both of South Bend.

ATLAS® MORTAR cement stays plastic and workable . . . spreads easily with less effort

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OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO:
Official Proposal Division,
Engineering News-Record
P.O. Box 12
New York 36, N. Y.

Bids: November 21, 1957.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORK'S ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 21st day of November 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe	FASS 57-16	Thomas Avenue, Co. Rd. Project S-487(1)	1.54	Asph. Conc.=1.46 Mi. Misc. Work=0.08 Mi.	$26,000 Plans $2	$459,000
DISTRICT No. 5, E. G. H. Youngmann District Engineer, State Office Bld.; , 65 Court Street, Buffalo 2, New York						
Erie	GISP 57-1	Grand Island State Parkway: South Parkway Extension (GISP 53-1) and South Parkway (GISP 51-1)	3.19	Sidewalks, Aluminum Chain Line Fencing & Misc. Work	$6,500 Plans $2	115,000
Erie	FARC 57-174	Transit Pts. 1 & 4, SH 88 & 1334-A-1 Project U-651(A)	2.00 (0.63 Acc.)	Asph. Conc.=2.52 Mi.; Misc. Work=0.11 Mi.; Prestress, Conc. Beam Bridge 124′	$60,000 Plans $3	1,074,000
Niagara	FAC 57-15	City of Niagara Falls: Arterial Rte., Walnut Ave. & Ferry Ave. (Main St. to Pine Ave. & Packard Rd.) Project U-500(9)	4.35	Asph. Conc.=4.22 Mi.; Misc. Work=0.13 Mi.; Prestressed Conc. Bridge 76′.	$86,000 Plans $25	1,585,000
DISTRICT No. 7, Robert W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton	FISH 57-23 FIC 57-21 FARC 57-175	Interstate Rte. 502, Sect. 7B-2 (Rugar St. to Cumberland Head Rd.): Plattsburg-Mooers Pt. 2, SH 259; SH 777; Tom Miller Rd. and Moffit Rd. Project I-IG-1119(10); F-576(4)	4.70 (11.94 Acc.)	Asph. Conc. Type 1A=16.60 Mi.; Misc. Work=0.04 Mi.; 4 Hy. Seps. I-Beams 181.9′, 284.8′, 249.2′ and 246.5′	$460,000 Plans $20	8,341,000
Jefferson	FISH 57-21	Interstate Route 505 (Sect. 7AB-3) SH 183, SH 1181, CR 161, CR 95 and CR 94. Project I-1118(14)	5.51 (5.64 Acc.)	Asph. Conc. Type 1A=11.11 Mi.; Misc. Work=0.04 Mi.; 3 Hy. Seps. Comp. I Beams 122′, 115.8′ and 316.5′	$255,000 Plans $20	4,629,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Suffolk	FASH 57-22	Sunrise Highway Extension (Shinnecock Canal Bridge) Project F-559(11)	0.13	Cement Conc. Pavt.=0.07 Mi.; Misc Work=0.06 Mi.; Weld. Pl. Girder Br. 374′	$45,000 Plans $3	830,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: February 3, 1958

Australia
Snowy Mountains Hydro-Electric Authority

Tenders are invited for Schedule of Rates contract for furnishing labour and materials and performing all work for the construction in New South Wales, Australia, of the following works:—

CONTRACT No. 20,034

MURRUMBIDGEE-EUCUMBENE TUNNEL, TANTANGARA DAM AND APPURTENANT WORKS

Tantangara Dam will be a concrete gravity dam approximately 145 feet high with a crest length of approximately 710 feet.

The Murrumbidgee-Eucumbene Tunnel includes a concrete intake and trashrack structure, a concrete lined circular tunnel 10 feet 2 inches in diameter and approximately 160 feet long, a concrete lined underground control structure approximately 210 feet long by 30 feet high by 12 feet wide, a partially lined tunnel of horse shoe section approximately 12 feet high by 12 feet wide and 10.3 miles in length and a concrete outlet structure including a measuring flume and baffled apron approximately 210 feet long.

LOCATION

The site of the works for the contract is in the Snowy Mountains Area in the south-eastern part of the State of New South Wales, Australia, at approximately longitude 148° 30′E and latitude 36°S. The elevation of the works varies between 3,600 feet and 4,200 feet above sea level.

TENDER DOCUMENTS

Tender documents comprising Form of Tender, Conditions of Tendering, General Conditions of Contract, Draft Form of Agreement, Schedule of Rates, Table of Estimated Quantities and Amounts, Specification and Drawings may be obtained by prospective Tenderers on or after 4th November 1957, on application to:-

Australian High Commissioner
Fifth Floor,
Royal Bank Chambers,
100 Sparks Street,
OTTAWA, Canada

Australian Consulate-General,
Fourth Floor,
International Building,
Rockefeller Center,
636 Fifth Avenue,
NEW YORK, U.S.A.

Australian Consulate-General,
206 Sansome Street,
SAN FRANCISCO, California,
U.S.A.

Liaison Officer,
Snowy Mountains Hydro-Electric Authority,
c/o United States Bureau of Reclamation,
Federal Center,
DENVER, Colorado, U.S.A.

Tender documents may be obtained on payment of Ten Pounds (Australian) for each set of documents for the contract. Four additional sets of documents for purposes of tendering will be provided free of charge at the time of inspection of the site.

PRELIMINARY DEPOSITS

A preliminary deposit of £A10,000 payable at Sydney, New South Wales, Australia, must be lodged with the tender.

INSPECTION OF SITE

Tenderers are required to inspect the site of the works and should communicate with the Snowy Mountains Authority, Cooma, New South Wales, Australia, regarding detailed arrangements.

GENERAL INFORMATION

For its own purposes the Authority has compiled certain information regarding the geology, hydrology, and meteorology of the region and general information concerning local conditions. The information is not part of the tender documents. This information will be made available to Tenderers when they inspect the site.

SPECIAL QUALIFICATIONS REQUIRED OF TENDERERS

Consideration of tenders is dependent upon Tenderers having a background of successful achievement in the execution of similar large civil engineering works and posssing technical and other resources necessary to complete the work successfully within the contract period.

ALTERNATIVE TENDERS

Concurrent with the invitation to tender for the construction of these works the Authority is also inviting tenders for the construction of—

Contract No. 20,025
Tooma Dam, Tooma-Tumut Tunnel and Appurtenant Works
Contract No. 20,033
T2 Diversion Dam, T2 Power Station and Appurtenant Works

Tenderers are invited to submit alternative tenders conditional on the Authority accepting their tenders for more than one contract.

SUBMISSION OF TENDERS

Tenders for the contract must be submitted in duplicate in accordance with the Conditions of Tendering, enclosed in sealed envelopes appropriately endorsed with the contract number and name of the work tendered for, and addressed to:-

The Business Manager,
Snowy Mountains Hydro-Electric Authority,
Post Office Box 332,
COOMA NORTH, N.S.W., Australia

The tenders must be lodged in the Tender Box at Head Office of the Authority at Cooma or be sent by pre-paid post in time to be delivered in the ordinary course of mail by 12:00 noon on Monday, 3rd February 1958.

K. See
Business Manager

Bids: November 25, 1957

Contract I — General Construction
Contract II — Plumbing
Contract III — Ventilating
Contract IV — Electrical

VILLAGE OF ENDICOTT
POLLUTION ABATEMENT PROGRAM
LODER AVENUE PUMPING STATION
AND
APPURTENANT FACILITIES
NOTICE TO BIDDERS

1. Sealed proposals for performing all work in connection with the General Construction, Plumbing, Ventilating and Electrical Work, Contracts I, II, III and IV, respectively, are hereby invited and will be received by the Board of Trustees until 5:00 P.M., Eastern Standard Time, on November 25, 1957 in the Council Chambers, Village Hall, Endicott, New York, and there publicly opened and read at 8:00 P.M., Eastern Standard Time.
2. The work will consist of providing all labor, materials, equipment and incidentals and performing all operations required for the construction, complete and ready for municipal operation, of the Pumping Station and Appurtenant Facilities, and all related work, as specified
3. Drawings, specifications, bidding and contract documents may be examined at the office of the Consulting Engineers, Leonard S. Wegman Co., Grand Central Terminal Building, New York 17, New York, or at the office of the Village Engineer at Village Hall and obtained from the latter at a deposit of $25 per set. Full refund will be made to actual bidders for return of each set in good condition within two weeks after closing date for receipt of bids.
4. Each bid must be accompanied by a Bid Security in the form of a Certified Check or acceptable Bidder's Bond payable at sight to the Village of Endicott in an amount not less than ten percent (10%) of the amount of the total bid. Such Bid Security will be returned to all except the three lowest formal bidders within five (5) days after the formal opening of bids, and the remaining Bid Securities will be returned within two (2) days after the Owner and the accepted Bidder have executed the contract, or if no contract has been executed, within sixty (60) days after the date of opening of bids, upon demand of Bidder at any time thereafter, so long as he has not been notified of acceptance of his bid. If the Bidder to whom the contract is awarded does not execute the contract and furnish the required bond within fifteen (15) days after receipt of notice of award, the aforesaid Bid Security shall be paid to the Village of Endicott as liquidated damages.
5. The Village reserves the right to reject any or all bids, to waive any informality in bids received and to accept that bid which in its judgment best serves the interests of the Village.

BOARD OF TRUSTEES
By: C. Burdette Parkhurst, Mayor
Dated November 1, 1957.

Bids: November 21, 1957

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF THE NORTH
EXTENSION OF THE BARNHART-
ADIRONDACK 230 KILOVOLT
TRANSMISSION LINE
NEW YORK
SPECIFICATION NO. PA-8-102
CONTRACT NO. T 4

NOTICE TO CONTRACTORS: THE POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the complete installation of the North Extension of the Barnhart-Adirondack 230 kv Transmission line, until 10:30 A.M. Eastern Standard Time on the 21st day of November, 1957, at the Authority's office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are estimated:

675 tons steel tower structures—structural steel and accessories furnished by the Authority.
16 miles of stringing—transmission line conductors and fittings furnished by the Contractor.
8 miles of stringing—overhead ground wire and fittings furnished by the Contractor.

The work shall be completed on or before November 1, 1958.

Plans, Specifications and Proposal Forms for the work may be obtained only from the Power Authority of the State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of ten dollars ($10.00 for initial set of Contract Documents and Five Dollars ($5.00) for each additional set. Two sets must be returned with each bid. Plans, Specifications and Proposal Forms will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, for the inspection by prospective bidders.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

GENERAL MANAGER
W. S. CHAPIN

Prequalification Date: November 15, 1957.

Board of Education — Bureau of Construction

Notice Re: Prequalification for Contractors

NOTICE IS HEREBY GIVEN THAT
The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:
General Construction of Playground (including Plumbing and Drainage) at Public School 97, East Houston Street between Mangin Street and Baruch Place, Borough of Manhattan.
Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y.
Bids, when advertised, will be received from prequalified bidders only.
Time for submitting prequalification applications by contractors will expire on Friday, November 15, 1957.
WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
Dated: October 30, 1957.
APPROVED AS TO FORM
Acting Corp. Counsel

Bids: December 10, 1957

Contract PN-420.005

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
BUILDINGS NOS. 191, 192, 193 & 194

Sealed proposals for the construction of Warehouse Buildings Nos. 191, 192, 193 and 194 on Tyler Street at Port Newark, N. J. will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, December 10, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, November 7, 1957

Bids: January 13, 1958

Government of Iraq Electrification of Basrah Power Project
Contract No. (9)
Emergency Diesel Generator

The Development Board and Ministry of Development of the Government of Iraq invite tenders from qualified firms for the supply and delivery, erection and supervision of operation, of Emergency Diesel Generator, for Basrah Power Station.

Full information regarding this tender can be obtained on and after November 4, 1957 from Embassy of Iraq, Washington or Messrs. Ewbank and Partners, 10/11, Grosvenor Place, London S.W. 1, England.

All Tender Documents are to be submitted in English to the Ministry of Development, on or before 12 noon, local time on January 13, 1958.

Act. Minister of Development

Many contractors depend entirely upon the

OFFICIAL PROPOSAL COLUMNS of Engineering News-Record

for Opportunities to bid.

They might not see your announcements if printed elsewhere.

You undoubtedly want their bids on your contracts. Make sure of them on your next contract.

The cost is only $2.10 a line per issue.

ADDITIONAL PROPOSAL ADVERTISEMENTS ON PAGE 166

Bids: November 14, 1957

Covering Old Erie Canal

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M., on November 14, 1957 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, New York, for:

> Contract M 57-14 for Covering Old Erie Canal, Diamond Street to Peterboro Street, Village of Canastota, Madison County, New York. Engineer's Estimate for Contract M 57-14 is $67,00.00.

Maps, Plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, Gov. A. E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, New York.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 57-14 may be examined and obtained at the office of Mr. Lacy Ketchum, 109 North Genesee St., Utica 1, New York.

The deposit for Plans and Proposal Forms for Contract M 57-14 is $15.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 57-14 must be submitted in a separate, sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $3,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any and all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: November 26, 1957.

Contract NYA-650.053

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
INTERNATIONAL ARRIVAL AND
AIRLINE WING BUILDINGS
MISCELLANEOUS ALTERATIONS

Sealed proposals for miscellaneous alterations to the International Arrival and Airline Wing Buildings and the Control Tower at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, November 26, 1957 at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, November 7, 1957.

Bids: November 14, 1957

Substitute Parking Facility at Westover

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Building Law and Highway Law, sealed proposals will be received until 10:30 A.M. on November 14, 1957 by Henry A. Cohen, Director of Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

> Contract F.C. 57-4 for Substitute Parking Facility at Westover, Unit No. 1, Endicott, Johnson City and Vestal Flood Control Project, Broome County, New York. Engineer's Estimate for Contract F.C. 57-4 is $52,000.00.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, Gov. A. E. Smith State Office Bldg., Albany, New York

(b) Department of Public Works, 270 Broadway, New York City, N. Y.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract F.C. 57-4 may be examined and obtained at the office of Mr. Joseph C. Federick, 71 Frederick Street, Binghamton, New York.

The deposit for Plans and Proposal Forms for Contract F.C. 57-4 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for F.C. 57-4 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $3,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Building Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any and all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: December 3, 1957

Contract NYA-950.001

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
5KV ELECTRICAL DISTRIBUTION
SYSTEM

Sealed proposals for the furnishing and installation of a 5KV electrical distribution system at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y. until 2:30 P.M. on Tuesday, December 3, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings. Additional sets will be furnished upon payment of 30:00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, November 7, 1957

Bids: November 29, 1957

Grade Crossing Elimination Project

Sealed proposals for the elimination of a grade crossing at Grove Avenue, Metuchen, N. J., will be received at the office of the Assistant Chief Engineer-Construction of the Pennsylvania Railroad Company, 1640 Transportation Center, Six Penn Center Plaza, Philadelphia 4, Pa., until 10:00 A.M., E.S.T., on the 29th of November, 1957, at which time proposals will be publicly opened and read.

This project is being constructed under an Order of the Board of Public Utility Commissioners of New Jersey.

The major items of work include the following approximate quantities:

Railroad Roadway	
Excavation	4,510 c.y.
Bridge	
Foundation Excavation	2,900 c.y.
Foundation Concrete	570 c.y.
Neat Concrete	940 c.y.
Struct. Stl. & W.I. Plate	560,000 lbs.
Reinforcement Steel	95,000 lbs.
Bituminous Concrete	390 sq. yds.
Stone Backfill	170 c.y.
Temporary steel sheet piling	4,400 sq. ft.
Highway	
Roadway Excavation	18,200 c.y.
Sidewalks	800 s.y.
Pipe railings	1,220 l.f.
4" concrete base course	4,400 s.y.
2½" Macadam intermediate course	4,400 s.y.
1½" Asphalt Wearing Surface	4,400 s.y.
Top Soiling and Seeding	4,500 s.y.
Miscellaneous	
4" Transite Ducts	3,000 l.f.
36" R.C. Pipe	220 l.f.
24" R.C. Pipe	350 l.f.
12" R.C. Pipe	200 l.f.
8" W.I. Pipe	400 l.f.
Curbing	857 l.f.

Contract documents may be seen at the above-named office and will be furnished upon deposit of $10.00 per set, which will be refunded upon the return of the documents in good condition within 20 days after the date on which bids are received.

Proposals must be submitted in a sealed envelope marked "Grove Avenue Grade Crossing".

Each proposal must be accompanied by a certified check of the bidder, payable to the Pennsylvania Railroad, or a bid bond to the favor of the Railroad Company, from a reliable surety company authorized to do business in the State of New Jersey, in an amount equal to five (5%) per cent of the amount of the proposal.

The right is reserved to reject any or all bids.

J. F. Piper—Assistant Chief Engineer—Construction
The Pennsylvania Railroad Company

Bids: December 23, 1957

Government of Iraq Electrification of Basrah Power Project

Contract No. (12)

Oil and Water Storage Tanks

The Development Board and Ministry of Development of the Government of Iraq invite tenders from qualified firms for the supply and delivery, erection and supervision of operation, of Oil and Water Storage Tanks for Basrah Power Station.

Full information regarding this tender can be obtained on and after October 21 1957 from Embassy of Iraq, Washington or Messrs. Ewbank and Partners, 10/11 Grosvenor Place, London S.W. 1, England.

All Tender Documents are to be submitted in English to the Ministry of Development, on or before 12 noon, local time on December 23, 1957.

Act. Minister of Development

Bids: December 7, 1957

Board of Management For the Port of Rangoon Development of Rangoon Port

Civil Engineering Contract No. 2. Transit Sheds, Warehouses and Workshops

Notice is given that the closing date for the above contract has been further extended to 12.0 noon on Saturday, 7th December, 1957.

WIN PE. CHAIRMAN.

OFFICIAL PROPOSALS

Bids: April 8, 1958

City of Baghdad Baghdad Sewerage Board Baghdad Drainage—Machinery Contract No. MI

TO MANFACTURERS OF DUAL FUEL (DIESEL OIL/METHANE) COMPRESSION IGNITION ENGINES

The Baghdad Sewerage Board invites Tenders for the manufacture, erection on site, and commissioning of the following equipment:—

CONTRACT MI. THREE DUAL FUEL ENGINES direct coupled to alternators of 460 KW at 3,300 volts, 428 r.p.m. and complete with engine auxiliaries: together with high and medium voltage switch and control gear, cables for the Soiada Treatment Works site and other ancilliary equipment.

The Tender Documents and Contract Drawings may be inspected during normal working hours after November 7, 1957 at the offices of the Baghdad Sewerage Board, Baghdad, at the Royal Iraqi Embassies in Bonn and Washington, at the Royal Iraqi Legations in Brussels and Rome, and also at the offices of the Consulting Engineers, John Taylor and Sons, Artillery House, Artillery Row, London, S.W. 1, and 464 Alwiyah, Baghdad. (Tel: 98736)

Copies of the Tender Documents and Contract Drawings may be obtained from any of the above-mentioned addresses on payment of I.D. 20 (Twenty Iraqi Dinars) or $56.00. This payment will not be returnable and must be made by check or Banker's draft payable to the Consulting Engineers.

The Tenders shall be in English and must be accompanied by a deposit of I.D. 5,000 (Five thousand Iraqi Dinars) or $14,000, either in case or by a letter of guarantee from an approved Bank in Iraq. The Tenders and accompanying documents must be enclosed in a sealed package which shall not in any way indicate the name of the Tenderer and must be delivered in Baghdad in accordance with the instructions contained in the Documents by 12 o'clock noon local time on the 8th day of April, 1958.

During the time allowed for tendering the Baghdad Sewerage Board reserves the right to amend the documents for the purposes of clarification or modification in design or contract conditions. Any such amendments will be notified in writing to prospective tenderers.

The Baghdad Sewerage Board does not bind itself to accept the lowest or any tender.

(Signed) FAKHRI AL FAKHRI
Chairman of the Baghdad Sewerage Board

Bids: November 19, 1957.

Contract BT-120.014

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUS TERMINAL
INTERIOR FINISHES FOR ROOM 2121
SUBURBAN CONCOURSE

Sealed proposals for the furnishing and installation of interior finishes and equipment for Room 2121 on the Suburban Concourse in the Port Authority Bus Terminal, Eighth Avenue and Fortieth Street, New York, N. Y. will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, November 19, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings. Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, November 7, 1957

OFFICIAL PROPOSALS

Bids: December 2, 1957

Constructing of Bridge Creek Dam and Related Work Contract No. 420

Sealed bids or proposals for "Constructing Bridge Creek Dam and Related Work, Contract No. 420" will be received at the office of the Director of Public Service, Room 203, Municipal Building, Akron, Ohio, until twelve o'clock noon, Eastern Standard Time, on December 2, 1957, and at that time and place will be publicly opened and read.

The proposed Bridge Creek Dam will be part of the City's Cuyahoga River Water Supply System, located in Geauga County, Ohio, about twenty miles northeast of the City of Kent.

The Contract involves the construction of an earth dam which will contain approximately 385,000 cubic yards of materials, a concrete intake tower and tunnel through the dam, a concrete overflow spillway, chute and stilling basin, all requiring approximately 7,250 cubic yards of concrete, and miscellaneous items of equipment for control of the water and operation of the facility.

The Drawings, Specifications and Information and Instructions for Bidders, and the Proposal, Contract and Bond forms are on file and may be seen at the office of the Director of Public Service, Municipal Building, Akron, Ohio. Copies may be obtained at the office of the Bureau of Water Supply, Room 404, Municipal Building, Akron, Ohio, or at the office of Parsons, Brinckerhoff, Hall and Macdonald, Engineers, 51 Broadway, New York, New York, upon deposit of twenty-five dollars, which sum will be refunded upon return of the Drawings and Specifications in good condition.

All proposals must be submitted upon the blank form and in accordance with the instructions furnished by the City.

Each Proposal must be accompanied by a certified or cashier's check on a National or State bank in the sum of One Hundred Thousand Dollars ($100,000.00).

A Bond in the sum of the full amount of the Contract, with satisfactory surety, will be required for the faithful performance of the Contract.

The Director of Public Service reserves the right to reject any or all Bids, and to waive any technical defects, as the interest of the City may require.

THE CITY OF AKRON, OHIO
By: Leo G. Walter
Director of Public Service
Published: October 31 and November 7, 1957

OFFICIAL PROPOSALS

Bids: November 14, 1957

Soil Explorations and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on November 14, 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 515, NORTHERN BOULEVARD, WHITESTONE PARKWAY AND FLUSHING RIVER BRIDGE, PROJECT I-1125(1) QUEENS COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. FA-SM-108.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. M. E. Goul, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $23,410.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

(Continued on page 166)

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Superintendent experienced in heavy sewer & water main construction under difficult conditions, by N. Y. State Contractor. Permanent position for qualified, responsible person looking for advancement with established firm. P-6165, Engineering News-Record.

University Career for Engineers—A number of teaching posts are open at a Canadian Engineering College in the fields of Civil, Electrical and Mechanical Engineering. The academic term extends from September 15th to May 1st and summer months are free for study, research or professional practice. Teaching loads run at 6 to 9 lectures and 3 to 9 laboratory hours, with a maximum of 15 hours per week. Salaries are open, depending on qualifications. Good pension and medical plans. Prime present requirements are in the fields of hydraulics and electronics but engineers in any of the three major fields are invited to inquire. P-6229, Engineering News-Record.

Prestressed concrete design engineer. Excellent opportunity to advance with new plant being built by large company initially starting in this field. Permanent position with company benefits. Send qualifications and starting salary desired to: P-6357, Engineering News-Record.

Experienced Sanitary Engineers with consultant. Openings for project engineer and designers. Permanent. Send resume. Cleveland, Ohio. P-6467, Engineering News-Record.

POSITIONS VACANT

Engineers for municipal and industrial water supply, sewerage and treatment projects. Opportunities for permanent connection with long established firm of consulting engineers in mid-west. Both E.I.T.'s and engineers considered. Full information and reference in first letter requested. P-5889, Engineering News-Record.

Heavy contractor, N. Y. State, needs man to assume charge of take off, purchasing, engineering, expediting. Requires sound background & responsible field experience in heavier water, sewer & treatment plant work. Excellent opportunity for qualified person seeking & able to advance. Reply to P. O. Box 147, Colvin Station, Syracuse, N. Y.

Wanted by expanding southern structural steel fabricator, experienced structural draftsman to assume duties of squad supervisor. State age, experience, education and salary requirement. Forward full information to P-6437, Engineering News-Record.

Superintendent, Building Construction. Highly capable superintendent wanted for company operating in eastern part of West Virginia, Maryland, Southern Pennsylvania and Northern Virginia. Furnish details as to experience, references, education and when available. P-6400, Engineering News-Record.

Wanted Sales Engineer Expanding 55 year old manufacturer of metal building products, including deck, wall and floor panels, windows and doors, seeks sales-minded engineers or equivalent experience in the construction field. Man selected will be trained and sent out to do field promotional work with architects and engineers before assignment to a regional sales office. Send resume to: Personnel Director, Fenestra Inc., 2250 East Grand Blvd., Detroit 11, Michigan.

EMPLOYMENT OPPORTUNITIES

DISPLAYED

The advertising rate is $31.80 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

—RATES—

NATIONAL
COVERAGE

UNDISPLAYED

$2.10 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box Numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36. November 21st issue closes November 11th

CIVIL ENGINEER

Young civil engineer interested in broad application of civil engineering.

Excellent opportunity with consulting firm. Liberal benefit plans and good working conditions. Location Middle West.

Send resume of education and experience with salary requirements to:

P-8228, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

BRIDGE DESIGNERS
STRUCTURAL ENGINEERS

We have career positions open for structures men in the uncrowded, colorful West! Professional recognition, advancement, security and fringe benefits. Hunt, fish, wo-k, live and enjoy life in Wonderful Wyoming! Starting salaries from $5100 to $7000 per annum. You may qualify! Write for details:

Personnel Director
Wyoming Highway Department
Box 931
Cheyenne, Wyoming

Structural Engineers. Excellent opportunity with a consulting engineering firm in the paper industry, for men with a minimum of 5 years' experience in industrial building design.

Send a recent photograph and resume of education, experience, and family status together with statement of salary requirements. Also advise best time for interview.

Central States Engineering, Inc.
1000 West College Avenue
Appleton, Wisconsin

Civil Engineer with 6 years professional engineering employment including 2 years in work related to Governmental Regulation of Public Utilities. Write the Connecticut State Personnel Director, State Office Building, Hartford, Conn.

When Answering
BOX NUMBERS . . .

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

POSITIONS VACANT

Continued from opposite page

Wanted—Engineers and Draftsmen experienced in design and preparation of plans and/or inspection of sanitary sewers, sewage treatment works, water mains, water treatment plants. State age, education, experience, salary and when can report. P-6483, Engineering News-Record.

Superintendent, with wide experience on cofferdams and bridge pier construction. P. O. Box 9802—Philadelphia 40, Penna.

Sales Engineer—Preferably experienced in estimating and detailing, reinforcing steel, etc. Engineering degree desirable. Established clientele—building and highway contractors Indiana and Illinois. State experience, educational background and salary requirements. Our employees know of this advertisement. P-6523, Engineering News-Record.

Accountant for large construction company now operating in Madison, Wisconsin area. Must be C.P.A., with construction cost systems, tax and auditing experience. Excellent position for man who can develop office systems and is ambitious. Legal experience would be helpful. All fringe benefits available. Send complete resume and references with application for interview. Salary open. Confidential. P-6521, Engineering News-Record.

Teaching appointments available. One Instruction, M.S. not required. One Asst. or Assoc. Prof. interested in Sanitary Engineering with M.S. or Ph.D. Begin Febr 1 or Sept. 1, 1958. Apply Dept of Civil Engineering, Univ. of Nebr., Lincoln, Nebraska.

Soils Engineer—New York office of long established consulting engineering firm is seeking a civil engineer with a sound, wide-inscope background in soils and foundation design. Send complete resume to: P-6283, Engineering News-Record.

Valuation & Rate Engineer. Exp. in valuation of water utilities, design of rate structures, depreciation studies and statistical analysis for computation of property survivor curves. Permanent position in private industry in center city Phila. Liberal benefits. Salary commensurate with exp. Submit resume and salary requirements. P-6551, Engineering News-Record.

Construction estimator, takeoffs, expediting; opportunity in growing & "Open" organization. State salary. P-6438, Engineering News-Record.

Estimating—Design work with field experience for general construction. Replies to 4545 North Keystone Ave., Indianapolis, Indiana.

Wanted—Man 35 to 55 for position as Safety and Employee Relations Supervisor with Construction Company working central U.S.A. area. Position requires man who works well with people. Give complete employment history. Martin K. Eby Construction Co., Inc., 610 N. Main, P.O. Box 1679, Wichita 5, Kansas.

Wanted: Construction Contracts Manager. Must be ambitious, aggressive man with experience in industrial construction. Not a routine "9 to 5" position. Top Salary to qualified individual, as executive in growing division of established firm with current projects in Midwest and on East Coast. P-6556, Engineering News-Record.

EMPLOYMENT SERVICE

Salaried personnel, $5,000-$30,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L. P. O. Box 674, Manchester, Vermont.

(Continued on page 159)

CIVIL ENGINEERS

Positions in California State Government in a variety of locations throughout the State for recent college graduates.

HIGHWAY

Office and field work in California's dynamic highway program.

BRIDGE

Design and field work in California's multimillion dollar bridge program.

SANITARY

Engineering control of water supply and waste disposal, air pollution and industrial hygiene.

No experience required for Junior position.

Junior positions
$481 to $530 a mo.

Positions open at this level only.
U. S. citizenship required.

Write for illustrated booklet:

C. S. Warner, Supervisor, Section E
801 Capitol Avenue
Sacramento 14, Calif.

CIVIL ENGINEERS

Experienced in

Drainage and Sewerage Design

Send Resume of Experience, References and Record of Past Earnings

METCALF & EDDY
1300 Statler Building Boston 16, Mass.
Mr. Charles H. Ingalls, Personnel Manager

Southern University with increasing enrollment and expanding program needs instructors for teaching college level courses preparing students for the building construction industry. College degree preferred, but satisfactory experience will be considered.

Department of Building Construction
College of Architecture and Fine Arts
University of Florida, Gainesville, Florida

CIVIL Engineers

Work and live in wonderful WISCONSIN

A rapidly expanding highway program offers:

Permanent civil service positions

Rapid advancement Challenging work

Starting salary based on experience

Civil engineering degree or professional registration required.

Write to:

Personnel Officer
State Highway Commission of Wisconsin
State Office Building
Madison 2, Wisconsin

Highway Engineers - Designers & Draftsmen
Bridge Engineers - Designers & Draftsmen
Architectural - Designers & Draftsmen

Permanent employment for qualified men. Ample opportunity for advancement based on merit; plus excellent retirement program, group life insurance, hospitalization, paid vacations and holidays. Salary commensurate with experience.
Architectural openings in Rochester, Pa. Highway & Bridge openings in Pennsylvania, Maryland, Mississippi, Ohio & West Virginia.

Air Mail Resume To: R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., INC. Baker Bldg. Rochester, Pa.

EXPERIENCED HYDRAULICS ENGINEER WANTED

Graduate engineer experienced in paper mill hydraulics, planning and development of piping layout systems, etc. for large expanding and progressive mill in Maryland. Good salary, all benefits and excellent opportunity for advancement. Send detailed resume of experience and education to

Director of Personnel
West Virginia Pulp & Paper Company
Luke, Maryland

CIVIL ENGINEERS

Civil Engineers with experience in hydraulics, concrete, soils or specifications for design hydraulic structures in Harrisburg, Pennsylvania. Graduate Civil Engineers also required for Chief, Construction Branch and Resident Engineers on Dam Construction. Salary open. State experience, salary requirements and references.

P-6428, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

HIGHWAY ENGINEERS

SURVEY — DESIGN — STRUCTURAL

Offices

South Bend, Ind. East Lansing, Mich. Wheeling, Ill.

Benefits

Company pays Hospital Insurance, including dependents, vacations, Profit-Sharing-Retirement Plan. Low Personnel turnover. Salary advancement periodically with your advancement in ability.

CHAS. W. COLE & SON

220 W. LaSalle Ave. South Bend, Ind.

ENGINEERS DESIGNERS

McKee has permanent openings at their Cleveland, Ohio, offices for men with at least 3 years' experience in any of the following:

Oil Refineries
Blast Furnaces
Steel Mills
Industrial Plants

In the following categories:

Piping Checkers
Process Piping
Piping Layout
Concrete
Structural
Electrical
Mechanical
Pressure Vessel
Mechanical Equipment
Specifications
Instrumentation
Estimators

Broad diversification of work in our 3 engineering divisions assures you security of employment.

Send detailed resume to
G. VICTOR HOPKINS

ARTHUR G. MCKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

CONSTR. SUPT.

American mining corporation in Jamaica doubling its capacity requires capable, young civil engineer to supervise construction of small buildings, roads, tramways, and installation of equipment. Prefer previous foreign engineering and supervisory experience and interest in indefinite stay Write immediately giving age, education, and experience.

P-6496, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

HEAVY CONSTRUCTION QUANTITY SURVEYOR

and estimator wanted by large engineering contractor. Location Chicago, no traveling. Should be preferably graduate C.E. and must have about 10 years experience in above or similar lines. Exceptional opportunity as suitable party should become Chief Estimator. Please state age, education, short experience outline and present salary.

P-6492, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CHIEF, DIVISION OF GENERAL PUBLIC WORKS OPERATIONS: Graduate Civil Engineer, age 30-50, for responsible, professional and administrative work involving street maintenance, building and grounds maintenance, garbage collection, etc.

DESIGN ENGINEERS: Graduate Civil Engineer to do detailed design work involving street paving, storm sewer and sanitary sewer projects. Must be capable of supervising subordinates involved in such activities.

Application should be made, giving minimum salary, to Department of Personnel, Springfield, Missouri.

(Continued from page 157)

POSITIONS WANTED

Superintendent Const. 20 years experience. Institutional, commercial, industrial projects. Engineer. PW-6329, Engineering News-Record.

Energetic Civil Engineer seeks supervisory position, minimum $12,000 yearly. Broad experience as owner's and contractor's engineer includes road and railroad location, very large topographical surveys, highway construction, docks, pulpmills, steam plants, large airbases and defense projects up to $60,000,000. Presently completing assignment as contractor's Project Engineer on large vehicular tunnel. PW-6361, Engineering News-Record.

Carpenter Superintendent—33 married. 11 years experience on bridges, buildings, and tunnels. 1 year Engineering background. Available immediately, will travel anywhere in States. References on request. PW-6392, Engineering News-Record.

Structural Engineer, registered graduate, 30 years subways, waterfronts, buildings, foundations, chemicals and power plants, etc., available for responsible position. PW-6405, Engineering News-Record.

General Supt. or Project Manager 25 yrs. experience: Industrial, commercial and Institutional construction. PW-6430, Engineering News-Record.

Chief Electrical Engineer—P. E.—Completing foreign contract—Available soon—Wide experience design & construction power plants, air bases, industrials, refineries, POL & AE—Multilingual—Foreign only on single or family status. PW-6417, Engineering News-Record.

Supt., Project Mgr. Combination available immediately for all types of construction. Experienced, Florida & West Indies. P. O. Box 3771, Sarasota, Fla. RI. 79843.

Construction Executive: Age 41. Nineteen years experience. All phases industrial, commercial, and institutional construction. Bids to completion, contract negotiation, supervision, job cost accounting and financing analysis. Desire permanent connection with young, growing, well financed organization with possible future participation. Minimum $15,000. Available November 1957. References. PW-6440, Engineering News-Record.

Struct. Design, 20 yrs. exp., wish overseas job. Will also accept field job. PW-6446, Engineering News-Record.

Construction Engineer, Civil graduate with over 9 years diversified construction experience, 7 years overseas. Spanish speaking, single, age 30, veteran. Desires foreign assignment in construction or administration. Available immediately. PW-6522, Engineering News-Record.

BCE 1950 Registered. Experience in highways, surveying, municipal construction, and sales. Seek job with contractor, engineer or sales. PW-6527, Engineering News-Record.

Project Manager or Superintendent—Twenty years experience in heavy construction. Prefer South, West or Overseas. Available immediately. PW-6524, Engineering News-Record.

Structural Designer with 30 years rounded, experience and some field—will prepare complete plan and liaison, or serve as employee with consultant, architect or contractor. Development work or investigation on full or part time. PW-6465, Engineering News-Record.

Construction Manager with long record as profit producer desires connection with western General Contracting Firm. Expert Estimating, Supervising, job planning. Archt. & Owners relations. PW-6517, Engineering News-Record.

Project Manager or General Superintendent. Age 41. 19 years experience in heavy construction domestic and foreign. From estimating to completion. Highways Airfields Pipelines Disposal-plants. Prefer southeastern states—would consider other. Presently employed. Available Oct. 21. PW-6487, Engineering News-Record.

Superintendent or general manager, 25 years experience heavy construction; highway grading and drainage, bridges, earthen dams, flood control projects; thorough knowledge estimating, bidding, cost, equipment, subcontracts, budget and finance. Location immaterial. PW-6533, Engineering News-Record.

POSITIONS WANTED

Project Manager or General Superintendent 12 yrs. supervisory exp. ind., comm. and res. const. Eng. background, B.A. deg. will relocate Southwest and Calif. Excellent ref. PW-6534, Engineering News-Record.

Soils Engineer, MS Harvard '49. Experienced in design of foundations, docks, bulkheads, retaining walls & highways. PW-6477, Engineering News-Record.

Sanitary Engineer, MCE Cornell, 19 years experience, 12 years in responsible charge, research & development, reports & planning, design, construction, operation of water & waste treatment facilities. PW-6444, Engineering News-Record.

Construction Supt. General construction. PW-6317, Engineering News-Record.

Electrical Engineer: Over thirty years experience covering all phases of electrical and mechanical construction and operation. Design certain fields. Married, no children, excellent health, free to travel. Employed. Available December 1. PW-6425, Engineering News-Record.

Structural Engineer 25 yrs. experience design bridges, buildings, sewage treatment, water filtration plants, 10 yrs. prestressed concrete design. PW-6548, Engineering News-Record.

Design Engineer, 20 yrs. exp. Plant Engineering, Industrial & Process Piping, Hydraulics, Material Handling, Heating, Air Cond. PW-6546, Engineering News-Record.

Superintendent: Grad CE, married, family, 10 yrs. sewer and water, 1 yr. highways, 1 yr. tank farms. Never lost money. PW-6561, Engineering News-Record.

POSITIONS WANTED

Graduated Civil Engineer (German Dipl.-Ing.), employed in SW-Africa, 26 years and single, not afraid of hard work, good references, desires employment in the USA with good possibilities for advanced training. Replies to: P.O. Box 5348, Windhoek, SW-Africa.

Estimator-General Construction BSCE, 33, Registered. 10 years experience in estimating, design and construction. 6 years estimating includes buildings, industrial (paper, cement, steel, glass) and utility plants (boiler, sewage, water). Have held responsible positions including present. Desire to relocate in southeast. Anything considered. Prefer small, progressive Florida general contractor. Available 30 days. Rush. All replies acknowledged with detailed resume. PW-6559, Engineering News-Record.

Structural-Architectural Designer, draftsman, spec. writer & project coordinator. B.S. age 28. Capable of handling all phases design & workings dwgs. 7 yrs. exp. in industrial, commercial & institutional. Prefer progressive consulting or architectural-engineering firm. Location immaterial. Resume upon request. PW-6555, Engineering News-Record.

Civil Engineer, 29, BSCE, MSCE, varied experience. Desires position in structural design. Resume upon request. PW-6565, Engineering News-Record.

Bookkeeper — full charge — knowledge of actg., 11 yrs. exp., architectural construction. PW-6554, Engineering News-Record.

Executive Secty. Stenog., Construction, Architectural, Engineering experience. PW-6566, Engineering News-Record.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES — EQUIPMENT USED or RESALE

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The advertising rate is $23.60 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED

$2.10 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

Send NEW ADVERTISEMENTS or Inquiries to Class. Adv. Div. of Engineering News-Record, P. O. Box 12, N. Y. 36, N. Y. November 21st issue closes November 11th.

REPLIES (Box No.): Address to office nearest you
c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

SPECIAL SERVICES

Surveyors: Alexander Milyko, Prof. Engineer & Land Surveyor, surveying field parties available.—Contract or Per Diem basis. Willing to travel to any location. Prefer preliminary highway & aerial topography surveys. Huntington Sta., 1124, New York Ave., L. I., N. Y.

Design of all types of bridges, welded or prestressed, detailing, review of plans. Group of Professional Engineers & Designers. SS-6407, Engineering News-Record.

Hyd. and concrete foundation as well as Structural steel designs. Checking, bar schedules, quantity and shop drawings. SS-6536, Engineering News-Record.

WORK WANTED

Pipe Crew: Complete, Engineer-Suptdt, Foreman, Operators, Oilers, Laborers. Experienced in all types sewer, water, utilities. WW-6560, Engineering News-Record.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations [illegible] Forty third year [illegible]
WILSON *Engineering Corp*
College House Offices HARVARD SQ. CAMBRIDGE MASS.

CONTRACT WORK WANTED

Design, specifications, contract drawings, for all types of simple, continuous, and long span bridges. Tight time schedules met. Professional Engineers. Bridgeway Associates, 127 Liberty St., N.Y.C.

BUSINESS OPPORTUNITIES

Civil Engineer, Licensed PE in NY has $50,000 to invest in contracting business equally capitalized. BO-6478, Engineering News-Record.

For Sale—Small Engineer-Survey Business (full or part interest) Established 1945. Annual gross $50,000. Excellent opportunity for aggressive Registered C.E. My health will not permit operation and promotion of business alone. P. O. Box 7176, Ft. Worth, Tex.

FOR SALE

Numbered Valve Markers manufactured for eng'rs & contractors. Free catalog, samples. Seton Nameplate Co., New Haven 15, Conn.

WANTED TO BUY

A Construction Company with a bona fide tax loss. Submit complete details in confidence.

BO-6499, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

Contractors School

NAME ....
ADDRESS ....
CITY ....

Learn how to figure labor, material costs on construction jobs. Write for 30 day free trial. CONTRACTOR'S SCHOOL, Box 12, Dallas, Tex.

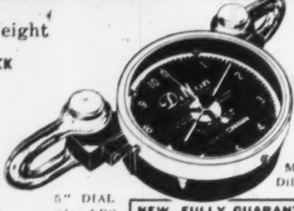
JUST RELEASED GOVT. SURPLUS

TENSIOMETER

TRADE NAME DYNAMOMETER

Measures Traction, Tension, or Weight

A PRECISION INSTRUMENT WHERE QUICK TESTS FOR SAFETY ARE ESSENTIAL.



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To determine strengths of: Bondings ● automobile and aircraft frame and cross piece buckling ● chain and cable ● earth anchors ● draw bar testing hydraulics ● clutch loads ● hardware fixtures ● tractor and truck load pulls.

Simple test arrangements: Simply apply. winch, block and fall, hydraulics, jack, or turnbuckle

This is NOT a spring measuring device operates by deflection of special ultrasensitive alloy beam. Registers a full scale reading in pounds with only .040 deflection. Certified by U.S. Bureau of Standards. Portable . . . rugged . . . retains sensitivity indefinitely . . . unaffected by temperature. *[FREE Illustrated Brochure on Request.]*

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10,000 LB TEST

$59.00

GOV'T COST $135.00

Complete with case, illustration of construction, and instructions for uses

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JOB LOT TRADING CO., Box 352, Church St. Station, N. Y. 8, N. Y.

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22 TON REAR DUMPS

Five-Model 63TD's-2 with standard bodies —3 with heated quarry bodies. All equipped with GM Detroit Diesel 300 H.P. Engines and Allison Torqmatic 3 speed transmissions.

18 YARD SCRAPERS

Four-Model S18's with Allison Torqmatic 4 speed transmissions—GM Detroit Diesel 300 H.P. Engines. 27.00x33 tires.

All new 1957. Used less than 3 months. Unusual values. For sale or rent. Offered subject to prior sale or disposition.

L. B. SMITH, INC.
357 W. Fayette St. Syracuse, N. Y.
Phone GRanite 5-2196

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FOR SALE OR RENT

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55 CFM Worth. (2)
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60 CFM Worthington (4)
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105 CFM Sullivan
105 CFM Worthington, gas (2)
105 CFM Worthington (diesel)
105 CFM LeRoi (gas)
120 CFM Gordon Smith (2)
125 CFM Worthington (2)
125 CFM Worthington (Rotary)
210 CFM Worthington (gas) (2)
210 CFM Worthington (diesel) (2)
226 CFM 100 psi Ing 40M
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OFFICIAL PROPOSALS

(Continued from page 156)

Bids: November 25, 1957

Construction of New Sewers in Connection with Proposed River Terrace Pumping Station

VILLAGE OF ENDICOTT
POLLUTION ABATEMENT PROGRAM
AND
FLOOD PROTECTION PROJECT
NOTICE TO BIDDERS

1. Sealed proposals for performing all work in connection with the Construction of New Sewers in Connection with Proposed River Terrace Pumping Station are hereby invited and will be received by the Board of Trustees until 5:00 P.M., Eastern Standard Time, on November 25, 1957, in the Council Chambers, Village Hall, Endicott, New York and there publicly opened and read at 8:00 P.M., Eastern Standard Time.
2. The work will consist of providing all labor, materials, equipment and incidentals and performing all operations required for the construction, complete and ready for municipal operation, of the New Sewers in Connection with Proposed River Terrace Pumping Station, and all related work, as specified.
3. Drawings, specifications, bidding and contract documents may be examined at the office of the Consulting Engineers, Leonard S. Wegman Co., Grand Central Terminal Building, New York 17, N. Y., or at the office of the Village Engineer at Village Hall and obtained from the latter at a deposit of $15 per set. Full refund will be made to actual bidders for return of each set in good condition within two weeks after closing date for receipt of bids.
4. Each bid must be accompanied by a Bid Security in the form of a certified check or acceptable Bidder's Bond payable at sight to the Village of Endicott in an amount not less than ten percent (10%) of the amount of the total bid. Such Bid Security will be returned to all except the three lowest formal bidders within five days after the formal opening of bids, and the remaining Bid Securities will be returned within two (2) days after the Owner and the accepted bidder have executed the contract, or if no contract has been executed, within sixty (60) days after the date of opening of bids, upon demand of Bidder at any time thereafter, so long as he has not been notified of acceptance of his bid. If the Bidder to whom the contract is awarded does not execute the contract and furnish the required bond within fifteen (15) days after receipt of notice of award, the aforesaid Bid Security shall be paid to the Village of Endicott as liquidated damages.
5. The Village reserves the right to reject any or all bids, to waive any informality in bids received and to accept that bid which in its judgment best serves the interests of the Village.

BOARD OF TRUSTEES
By: C. Burdette Parkhurst, Mayor
Dated: November 1, 1957.

Bids: December 10, 1957

Livernois Extension Relief Sewer Sections I and II Department of Public Works City of Detroit, Michigan

CONTRACTS PW-2194 AND PW-2195

Sealed proposals for a sewer, located in Livernois, from Joy Road to Puritan, will be received at the Office of the City Engineer, 528 City-County Building, Detroit 26, Michigan, until 2:00 P.M., Detroit time, December 10, 1957, and then at such place and time publicly opened and read aloud.

The work is separated into two Contracts, namely PW-2194 and PW-2195. Bidders may submit a separate bid on each Contract or may submit a combined bid on both Contracts. Both Contracts are to be constructed concurrently even though both may be awarded to the same bidder .

The work included in Section I, Contract PW-2194, consists of approximately 0.35 miles of 11'6" diameter and 1.2 miles of 11'0" inside diameter concrete sewers to be constructed in tunnel in Livernois from Joy Road to Fullerton. This Contract also includes the construction of the connections between the new 11'-6" sewer and an existing sewer in Livernois at Joy Road.

The work included in Section II, Contract PW-2195, consists of approximately two miles of concrete sewers, varying in size from 10'-6" to 6'-0" inside diameters, built in tunnel in Livernois from Fullerton to Puritan.

The Bidding Documents may be examined at the Office of the City Engineer during business hours, and copies may be obtained upon deposit of $50 per set, which includes both Contracts, which deposit will be refunded upon the return of the Bidding Documents in good condition within 10 days after the date for opening of bids.

Each proposal must be accompanied by a certified check, bank draft, or a satisfactory surety bid bond in an amount not less than 5 percent of the total bid price as guarantee and security for the acceptance of the Contract.

Checks shall be made payable to the Treasurer, City of Detroit.

No proposal once submitted may be withdrawn for at least 45 days after the actual opening of the bids. The City of Detroit reserves the right to waive any irregularity in any bid, or to reject any or all bids, should it be deemed for its best interest.

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Editorials

The Defense Rests

ROBERT MOSES, who frequently uses the English language as a whip, recently offered a few well chosen words in defense of the construction man, a variety of homo sapiens he has come to know well.

As chairman of the New York State Power Authority, Mr. Moses was not pleased when the District Attorney for Niagara County asked all law enforcement and administrative officers of the county to meet and discuss the problems which he claims will arise from the influx of workers needed in the construction of the Niagara power project. In a scorching letter to the district attorney, Mr. Moses accused him of using a non-existent problem to further his campaign for re-election. And he cited the good record of the workers on the St. Lawrence Power and Seaway Project.

But his real defense of the construction worker came in the words: "These men are not hoodlums. They are decent, honest, self-respecting family men. A large part of them will be recruited locally. The rest will be professional construction workers of great skill who move from one huge construction project to another and take great pride in changing the earth's surface for the benefit of man."

Amen! The manner of the average construction worker is admittedly not that of a mollycoddle, for which we can be thankful. But any inference that his manners—or morals—are any worse than those of any other segment of the general public is way off base. Mr. Moses pegged that fact most effectively.

Survival Strength for Structures

THE GREATLY INCREASED THREAT to lives and property posed by today's megaton nuclear bombs has made quite plain by several speakers during a discussion of design against blast forces at the annual meeting of the American Society of Civil Engineers. Also made clear was the need for greater protection of our people and for making our structures less vulnerable to nuclear attack.

The trend in building design today, however, is in the opposite direction, especially for residential and commercial construction. Structural frames generally are designed for the minimum wind or seismic forces allowed by local building codes; blast forces, which may be several times larger, are ignored. In addition, in contemporary buildings, the frames get less help from floors, walls and partitions in resisting lateral forces than the frames in older buildings. And the hazards of flying glass from windows shattered by blast are greater in the newer structures because windows are larger than in the past, and lighter, thinner partitions are used to subdivide interior spaces—if, indeed, any dividers are used. There is almost no place to hide.

One of the speakers at the ASCE meeting, Arsham Amirikian, Bureau of Yards and Docks consultant, urged the Society to take the lead, and with the cooperation of other societies, develop minimum design criteria for protection against blast forces, the adoption of which could be made compulsory by legislative action. Every building should have "survival strength" built in, he said. Until suitable criteria are developed, he suggested that buildings be designed for pressures of 2 to 10 psi (depending on the type of occupancy) with increased allowable unit stresses.

Mr. Amirikian did not say what should be done to protect against the hazards from shattered glass and other loose objects that might be blown about. Perhaps, he assumes that adequate warning of attack will be given to permit building occupants to reach shelter areas that would have to be provided on every floor. In any event, the type of minimum protection visualized would not be expensive. And it would also be useful in protecting lives and property against hurricanes and tornadoes, from which no part of the country has been shown to be immune, as well as against earthquakes.

Building survival strength into our structures, and providing protection against loose objects sent flying by blasts makes good sense. Engineers should accept this concept as basic in all future design.

Watch Those Splices

FAILURE OF A ROOF BEAM in an Omaha building recently may prove to have been a fortunate mishap for the construction industry since it pointed up a danger that might have gone unrecognized until a serious disaster occurred.

The beam that failed was one of five 100 ft post-tensioned concrete beams, erected partly prestressed, with the final prestress applied after they were in place. At the time of failure, four had received the roof deck, whereas the fifth beam had only half its load. About two hours after final prestress, with the tendons not yet grouted to establish bond with the concrete, that beam cracked at one section and buckled upward about 1 ft near midspan.

The beam had been prestressed with 14 end-anchored bars, draped in a vertical curve to vary the prestress. But because the available bars were only 80 ft long, all tendons had to be spliced which, to prevent bond with the concrete, required 3 in. dia sheaths compared with the 1⅜ in. conduit used to encase the bars. At the section where the crack occurred, seven of the 14 bars were spliced. It seems likely that without dead load and with the cross-section area reduced by the sheathed splices, there was too much prestress.

The lesson: Don't concentrate splices at one section of a beam unless there is no possibility that the section will be weakened.

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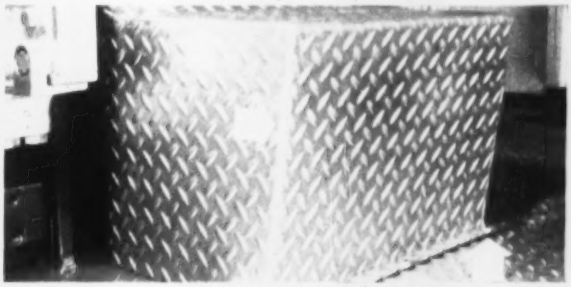

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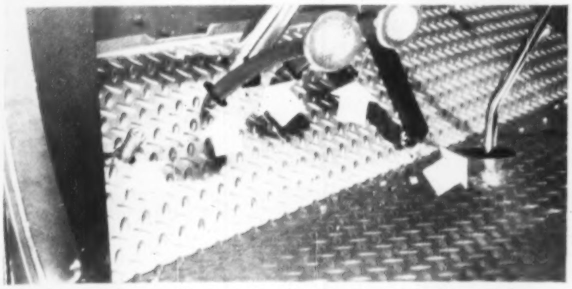

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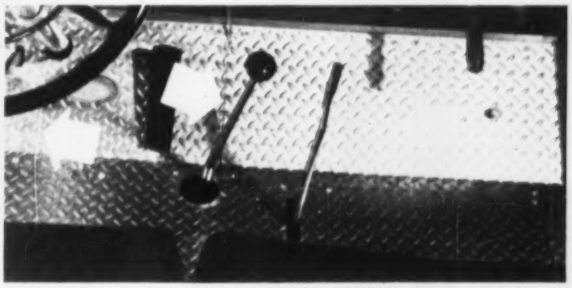

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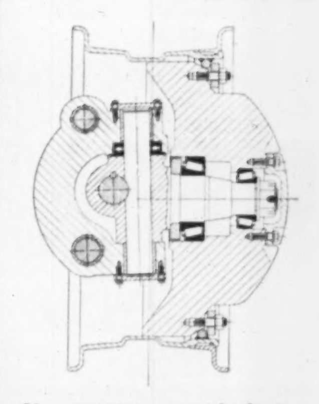

How **GALION** mounts the front end assembly of the T-700 on Timken bearings.

World's largest motor grader weighs more than 20 tons—24 TIMKEN® bearings take the load

THE world's largest motor grader (above) sets up enormous loads as it slams a road into shape. And when it rolls on a steep grade, the thrust loads are even greater. To make sure their T-700 Grade-O-Matic could take *all* the loads, the Galion Iron Works & Manufacturing Company specified 24 Timken® tapered roller bearings—for the reverse gear case, transfer case, front wheels and king pins, and the rear wheel tandem drive.

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Timken bearings are geometrically designed to provide true rolling motion—precision manufactured to live up to their design. They practically eliminate friction. And by holding shafts concentric with their housings, they make closures more effective—keep lubricant in, dirt out.

And to make sure we control the quality of Timken bearings all the way down the line, we even make our own steel—an extra step no other American bearing manufacturer takes.

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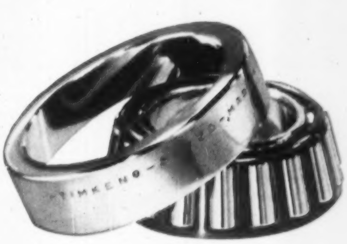

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